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THE CLINICAL USE OF POTASSIUM SULPHOCYANATE IN HYPERTENSION*

A Preliminary Report of Fifty-Nine Cases

BY ROBERT S. PALMER, M.D.,† LOUIS S. SILVER, M.D.,† AND PAUL D. WHITE, M.D.,† WITH THE ASSISTANCE OF WILFRED BLOOMBERG, M.D., AND RICHARD G. HAHN, M.D.

THE sulphocyanates (thiocyanates, Rhodan compounds) have long been known, but only in the last four or five years has interest in them as a therapeutic agent in hypertension been revived. We have used sulphocyanate of potassium during the past year and one half in the clinic and in private practice and report herewith our experience with this drug in fifty-nine cases.

LITERATURE

The use of sulphocyanate salts in medicine has been fully reviewed by Nichols, Westphal and Blum, Gager, and Smith and Rudolf, including Claude Bernard's experiments in 1857 on anticoagulants and Pauli's observations in 1903 on the inhibitory effect of the sulphocyanates on precipitation of protein. Pauli thought these salts had the power to remove calcareous deposits in arteries. He reported the drug to be useful in the treatment of neurasthenia and essential hypertension.

A review of the pharmacology and toxicology, as well as of the clinical use of the sulphocyanates, was published by Nichols in 1925. These salts are excreted as such by the kidneys, as well as in the saliva and tears. They do not change into the hydrocyanic acids and cyanides, though the reverse change occurs readily. According to some investigators the sulphocyanates increase the urinary output of sulphur and nitrogen. Prolonged administration in sublethal amounts to animals produces no harmful effects, though disagreeable symptoms may be produced in man. In large doses these salts act as a muscle poison. In a dog the heart may be stopped by them. If the effect is not immediately fatal, a rise in blood pressure results. Finally intense stimulation supervenes, with tetanus, rigidity, convulsions, coma and death. Diarrhea is noted. A diuretic action was observed only in rabbits. The minimum lethal dose has been estimated variously from two hundred to four hundred milligrams per kilogram for a man weighing seventy kilograms. The action is supposed to be a property of the sulphocyanate radicle. The potassium salt is said to be more toxic than the other salts.

Nichols did not give detailed clinical reports but stated that he had used the sodium salt in arterial hypertension with most satisfactory results for upwards of fourteen years. He noted a cumulative effect. The drug was given in doses of five grains three times a day, gradually reduced to once a day. It was used in courses of three or four weeks, separated by rest periods of two or three weeks, depending upon its effects.

Westphal and Blum found the sulphocyanates effective in seventy per cent. of their seventy-five cases. Reductions of ten to sixty millimeters of mercury were obtained by them, using doses of seven and one half grains to one and one half grains three times a day, later once a day. The larger doses were found to give uncomfortable toxic effects, such as laryngitis, bronchopneumonia, conjunctival hemorrhages, skin lesions and nausea. The patients were subject to various inflammatory conditions. These authors have proposed a theory explaining the action of the sulphocyanates based on the work of various investigators since Pauli. Essential hypertension, according to them, may be due to retention of cholesterin in the blood stream; the hypercholesterinemia holds the small arterioles in constant tonus and makes them less permeable; the sulphocyanates increase the permeability of the arterioles and decrease their tonus; moreover the sulphocyanates bring into play lecithin, which is antagonistic to cholesterin. It is the increased permeability of the cells which is believed to cause the inflammatory reactions mentioned above as the result of too large doses.

Kramer noted favorable symptomatic and objective effects from the use of the sulphocyanates and Rhodapurin (ammonium sulphocyanate and trimethyl xanthine) on cases showing marked hypertension of the essential type without evidence of nephritis or heart failure. Lörcher reported similar results. Cases of the vasomotor type, so called, were most helped. Askanazy obtained good results with calcium sulphocyanate in fifty cases of hypertension

*From the Cardiac Clinic and Electrocardiographic Laboratory of the Massachusetts General Hospital.

†For record and address of author see "This Week's Issue," page 737.

mostly of the essential type. Pressure was reduced and symptoms were relieved. The drug was most successful in the essential climacteric and sclerotic types, if labile changes in pressure were noted.

In addition to a review of the literature Gager reported thirty-five cases of hypertension treated with chemically pure potassium sulphocyanate, one and a half grains in one drachm of water, three times daily for one week, twice daily for one week, and then once daily or once every other day. The pressure was reduced 20 to 60 millimeters of mercury systolic and to a lesser extent diastolic. Marked renal insufficiency was a contraindication in his experience. He suggested the use of the drug prophylactically.

Addison used the bromide and chloride of potassium and reported clinical and theoretical evidence to support his theory that the potassium ion is of prime importance in reducing the blood pressure.

Smith and Rudolf used the sodium sulphocyanate with good results in their seventy cases. A fall in pressure was also noted in six normal cases treated. They found relatively smaller doses effective and noted a cumulative action. Weakness and fatigue were observed in a few cases. Slight reduction was noted in those cases with renal changes or arteriosclerosis.

RESULTS OF OUR STUDY

We have used potassium sulphocyanate in fifty-nine cases in the Out-Patient Department of the Massachusetts General Hospital and in private practice for varying periods of time up to one and one half years. Most of our cases fall under the general diagnosis of essential hypertension. Many of them exhibit the secondary effects of hypertension or of age, namely hypertensive heart disease, renal changes, congestive or anginal failure and arterial disease. We have used the drug in doses of one grain and a half in one drachm of water three times a day for the first week, twice a day for the second week, and once daily thereafter. This has been varied somewhat in different cases. Usually one course of three or four weeks on the above schedule has been employed before omitting the drug. We have used both the auscultatory method of determining the blood pressure and the Tycos recording sphygmomanometer and have found the two methods in agreement. The latter has the advantage of giving a permanent graphic record in a given case. Almost all the patients had a period of bed rest in the hospital or a period of observation while ambulatory to establish a level before starting the sulphocyanate treatment. The blood pressures of the group varied before treatment from 165 mm. mercury systolic and 90 diastolic to 280 mm. systolic and 150 diastolic in different cases. The patients were continued on the same treatment or regime as previously except for the addition of the sulphocyanate. A few cases were on diets for weight reduction. The age distribution is shown in Table I. The majority of our patients were in the fifth and sixth decades of life.

We have arbitrarily chosen a drop of thirty or more millimeters of mercury in the systolic pressure to indicate a definite effect. We realize that such a variation is not unlikely in the course of successive readings in these cases, but where such an effect persists, especially when it has occurred after a control period and when other factors have remained the same, we believe it may be ascribed to the drug. On this basis we have divided our fifty-nine cases into two groups, those showing a definite effect, namely a fall of thirty or more millimeters of mercury in the systolic pressure while under treatment, and those showing little or no effect, namely a fall of less than thirty millimeters of mercury in the systolic pressure. A few cases showing a temporary fall of thirty millimeters were included in the second group, as were a few cases who showed little or no effect, possibly because of too brief or too irregular treatment.

TABLE I*

	Definite reduction of blood pressure	Little or no effect	Totals
Males	11	10	21
Females	14	24	38
Totals	25	34	59
Age groups:			
21-30	0	1	1
31-40	2	2	4
41-50	8	13	21
51-60	10	12	22
61-70	4	6	10
71-80	1	0	1
Totals	25	34	59

*See text for explanation.

Using this criterion, twenty-five cases (42.4%) showed a favorable effect from the drug, while thirty-four cases (57.6%) did not. Table I also shows the distribution of sex and age. There is a somewhat higher relative incidence of males in the favorable group. In the group as a whole females predominate. This is probably due to the fact that the ages of most of our patients placed them in the fifth and sixth decades when menopausal hypertension might be expected.

In the favorable group arteriosclerotic and hypertensive heart disease was diagnosed seven times, and in the group showing little or no effect it was diagnosed six times. Hypertensive and irritable heart was diagnosed three times in the latter group and not once in the former group. Hypertensive and rheumatic heart disease occurred once in the second group. A diagnosis of essential or primary hypertension was made eighteen times in the group showing a favorable effect and twenty-three times in the

group showing little or no effect, seventy-two and sixty-seven per cent., respectively. There was some evidence of chronic nephritis in three cases in each group. Angina pectoris occurred three times in the first or favorable group and four times in the second group. There was a history of cardiac asthma twice in the former and twice in the latter group. Cerebral vascular crises occurred twice in the favorable group and three times in the group showing little or no effect from the drug. Valve lesions were rare in this series, aortic regurgitation being present twice in the first and once in the second group. Mitral stenosis was present once in the second group. Syphilis was diagnosed once in the second group. Gallop rhythm occurred twice in the favorable group and once in the group showing little or no effect. There was thus no way of predicting beforehand from the clinical diagnosis in this series which cases would show a favorable effect.

Of the eight cases showing the most marked fall in systolic pressure (40 to 70 mm. of Hg.) five were cases of definite essential hypertension, two of these probably related to the menopause. The three remaining cases were diagnosed as having arteriosclerotic and hypertensive heart disease. One patient had evidence of renal injury, two had the signs of aortic regurgitation and one of these suffered from angina pectoris.

We found that the initial effect of the drug used for three weeks (in doses of one grain and a half three times a day, twice a day, and once a day respectively, for one week on each dosage) was usually the greatest. Among the twenty-five favorable cases there was a fall in pressure of fifty or more millimeters of mercury systolic in five cases, and a fall of forty to fifty millimeters in three cases, while the others dropped thirty to forty millimeters. In twelve cases the initial effect was maintained and in four more the blood pressure became still lower. In six cases there was a subsequent rise in pressure. In three patients the treatment was too brief or irregular to permit definite conclusions, though a fall of thirty or more millimeters was obtained by the treatment. The diastolic pressures in the favorable group fell fifty-five millimeters in one case, twenty or more in seven cases, and ten or more in fifteen others. There was no fall in one case and one case showed a rise of ten millimeters in diastolic pressure, while the systolic pressure fell thirty millimeters. Thus there was a fall in diastolic pressure in all but two cases. This fall was usually less in degree than that obtained in the systolic pressure.

Our second group, showing little effect, contrasts with the first group only in degree. Thirteen of the thirty-four cases showed a fall of twenty or more millimeters of mercury systolic, though this was only temporary in some. Eleven cases showed a fall of nineteen millimeters or less; eight others showed no fall. One had a rise of thirty millimeters and one had a rise of ten millimeters. Five cases dropped twenty millimeters or more in diastolic pressure; eighteen cases showed a fall of less than twenty millimeters; one had a rise of thirty millimeters diastolic and one of five millimeters. Nine showed no change in diastolic pressure. With regard to persistence of effect in those cases under observation over a considerable period of time, eleven showed no appreciable significant change in blood pressure and in eight the blood pressure became higher. In three the readings were so variable that no definite conclusion could be drawn. In three cases a fall of twenty to twenty-five millimeters systolic and ten to fifteen millimeters diastolic persisted after the drug was omitted.

In the favorable group, after the initial fall, the drug was omitted and the blood pressure was followed in fourteen instances. In three cases the systolic pressure rose ten millimeters; in one it rose fifteen millimeters; in two, twenty millimeters; in one, twenty-five millimeters and in five, thirty or more millimeters, on omitting the drug. Two cases showed no change. The diastolic pressure remained unchanged on omitting the drug in five, rose forty-five millimeters in one, five millimeters in one, ten millimeters in two, and fourteen, fifteen, seventeen and twenty millimeters in four others respectively. It fell five millimeters in one case. Finally treatment was again instituted in eleven of these fourteen favorable cases and a fall in systolic blood pressure was again obtained in all, though not so great as with the first course of treatment. In five of these cases, the diastolic pressure did not fall, in three it fell only five millimeters and in three, fifteen, twenty and thirty millimeters respectively. In general the same results, though of less degree, were obtained in the group showing little or no effect.

The subjective reaction was especially noted in fourteen of the group showing a favorable effect on the blood pressure. Seven patients felt better, six felt no change. One patient felt weak or exhausted when taking the drug, a symptom which was relieved when the drug was omitted. This patient showed a fall of fifty-five millimeters of mercury systolic and fifty-five diastolic. Urine examination in this case showed evidence of chronic nephritis.

In the group showing little or no effect on the blood pressure the subjective reaction was particularly noted in eighteen instances. Eight patients felt better, five felt no change. One patient complained of weakness (with a fall of twenty millimeters in systolic and diastolic pressures). Two patients complained of anginal pain, one reporting by letter attacks of pain severe enough to suggest coronary occlusion. Two other patients complained of precordial distress when taking the drug.

We have noted no frankly toxic effects from the drug as we have used it. There have been

one or two patients with increased frequency of urination and one or two have noted a mild looseness of the bowels. One patient felt some gastric discomfort when given a somewhat higher dose of potassium sulphocyanate than is commonly employed.

The following cases are illustrative of our series:

ILLUSTRATIVE CASES

CASE I. J. B., a married Italian-American barber, forty years old, whose family history was unimportant, was known to have had hypertension for several years. Three years before beginning potassium sulphocyanate therapy the systolic pressure was 205 mm. of mercury and the diastolic 135 mm. The urine at that time showed albumin and rare hyaline casts. The non-protein nitrogen was 30 mgm. per 100 c.c. of blood.

The patient had always been a hard worker, a heavy eater and an obese man. He suffered many respiratory infections and had been ill with bronchopneumonia twice for which he had had hospital treatment.

Dyspnoea and substernal distress on exertion, growing gradually worse for two months, brought him into the Massachusetts General Hospital for the third time. Urine examination again showed a slight trace of albumin and occasional casts. Non-protein nitrogen and phenolsulphonephthalein tests were normal. The heart was found considerably enlarged both by physical and Roentgen ray examination. There was a diastolic gallop rhythm. Blood pressure was 220 millimeters of mercury systolic and 140 millimeters diastolic after eight days in bed. Alternation of the pulse was found.

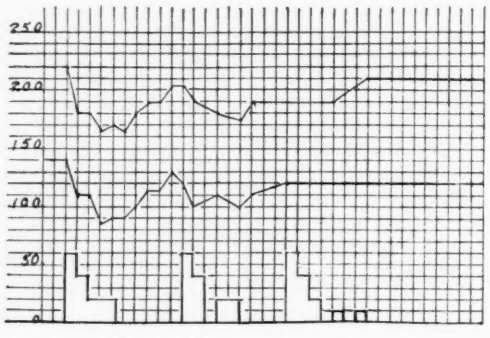

FIGURE 1. Case I. In this figure and in the remaining figures each two divisions upward from the base line represent one grain and a half of sulphocyanate, and each ordinate marks off one week, except where dotted lines indicate the passage of longer periods. For instance, the first course of treatment in Case I consisted of one week with four and a half grains daily, one week with three grains daily and two weeks and a half with one grain and a half daily. Each ten millimeters of mercury systolic and diastolic pressure is indicated according to the scale at the left.

Potassium sulphocyanate was then started, with the results indicated in Figure 1. An immediate and definite drop in both systolic and diastolic pressures was obtained. When the drug was omitted, these pressures rose again. A second course produced the same effect as the first. An interesting point is that this patient felt better when not taking the drug. He complained of vague weakness and loss of strength during its administration and found relief from this feeling when it was omitted.

The patient continued to improve clinically. He was digitalized and was put on a reducing diet with some loss of weight.

Diagnoses: Hypertensive (and possibly arteriosclerotic) heart disease. Essential hypertension (or chronic nephritis with hypertension). Angina pectoris.

CASE II. J. H. C., a single, native, retired grocer sixty-four years old, whose family and past history were irrelevant, entered the hospital complaining of occasional sharp precordial pains on exertion for twenty years. For ten years he had noticed gradually progressing dyspnoea on exertion. For six months attacks of dyspnoea had been awakening him at night once a week. For two days before entrance he had been raising bloody sputum. The features of the physical examination were obesity, broad supracardiac dullness, hypertrophy of the heart, absolutely irregular pulse, a few moist râles at the lung bases, absence of oedema and a blood pressure of 230 millimeters of mercury systolic and 170 millimeters diastolic. The urine showed a large to a slight trace of albumin and occasional hyaline and brown granular casts. The phenolsulphonephthalein test showed a 25% excretion in two hours. The non-protein nitrogen measured 37 to 59 mgm. per 100 c.c. of blood.

The patient was improved by two and a half weeks' rest in bed, at the end of which period his blood pressure was 230 millimeters of mercury systolic and 130 millimeters diastolic.

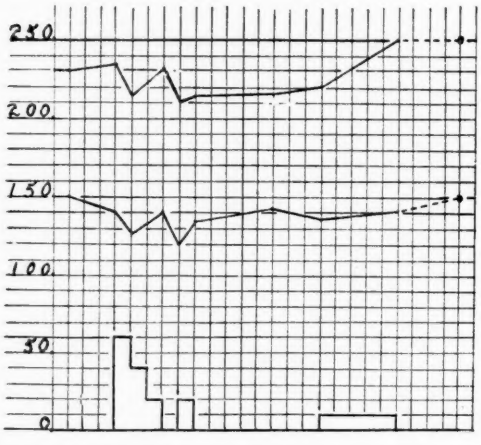

FIGURE 2. Case II. The dotted lines represent a period of three months.

After discharge potassium sulphocyanate was administered with some reducing effect, as shown in Figure 2. This patient at first felt somewhat better when taking the drug, but finally reached the same conclusion as did patient number one, namely that he felt stronger when not taking it.

Diagnoses: Arteriosclerotic and hypertensive heart disease. "Arteriosclerotic" chronic nephritis. Auricular fibrillation. Cardiac asthma.

CASE III. L. M. M., a white married housewife, forty-three years old, whose family and past history were essentially negative, was known to have had a blood pressure of 160 to 180 millimeters of mercury systolic for five years. She complained chiefly of exhaustion without other definite symptoms.

Physical examination and X-ray study of the heart showed enlargement, and characteristic aortic regurgitant and mitral stenotic diastolic murmurs were heard.

Diagnoses: Essential hypertension, probably related to the menopause. Rheumatic heart disease. Aortic regurgitation. Mitral stenosis.

Figure 3 shows the course of the systolic and diastolic pressures and the amounts of sulphocyanate given. At first with little change in pressure the patient felt better. However she had definite, though slight, attacks of angina pectoris during the first course of treatment and again during the third course, while during the six months without treatment she was free from angina pectoris. Finally,

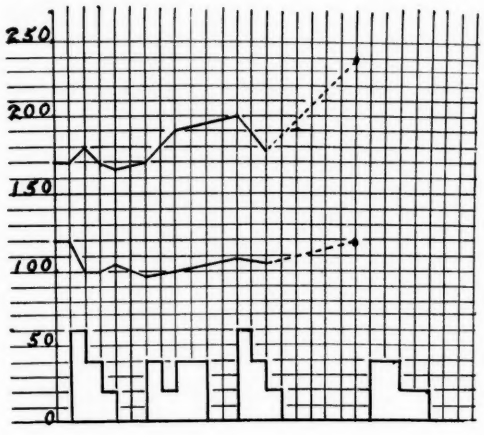

FIGURE 3. Case III. The dotted lines represent a period of six months.

after less than a week of the fourth course, she had three severe attacks of pain in the left chest. She was not seen during or after these attacks.

CASE IV. A. C., a married housewife, fifty-one years old, complained chiefly of paroxysmal palpitation, vertigo, and occasional dyspnoea. Her mother died of heart disease at forty-seven years of age and one sister died of tuberculosis. The past history was negative. An electrocardiogram during an attack of palpitation showed auricular flutter. The urine was negative. The heart was found enlarged on physical examination and by X-ray.

Diagnoses: Essential hypertension (menopause). Paroxysmal auricular flutter.

The attacks of palpitation were fairly well controlled by quinidine sulphate. Vertigo remained as the chief complaint.

After a year and a half of observation in the clinic, she was placed on potassium sulphocyanate therapy (Figure 4).

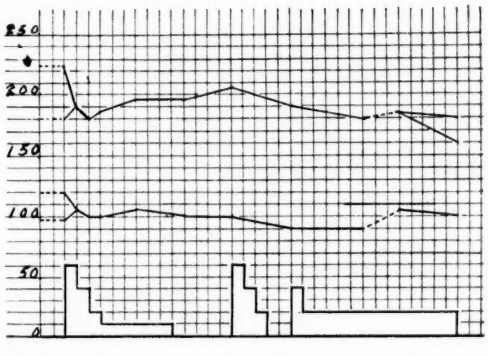

FIGURE 4. Case IV. The dotted lines at the beginning of the chart indicate the extremes obtained at different readings during a year and a half before the sulphocyanate was started. The dotted lines at the end of the chart represent a period of two and one-half months.

The two readings charted at the last observation show a fall of 20 mm. of Hg. after the patient was reassured in regard to her condition.

In this case there was apparently but slight hypotensive effect following use of the drug. The relief from vertigo, in contrast, was very marked. The natural variations of the blood pressure and the effect of psychic influence must always be considered in estimating any therapy for hypertension. The drop of twenty millimeters systolic at the last examination followed earnest reassurance in regard to her condition.

CASE V. E. M., an unmarried chief nurse in the United States Navy, aged fifty-five years, complained of having had an ache in both wrists radiating up her arms, for a period of six months at the time of her menopause, five years previous to the present study of her case. The systolic pressure at that time was 200 millimeters. Since that time nervous spells with dyspnoea and sweating troubled her. She was easily fatigued. One year before being seen by us, while quiet, she suffered severe pain in the back of the left shoulder, neck and upper arm (not in the chest), lasting several hours. This was diagnosed as angina pectoris. She also complained of giddiness, faintness, nervousness and sighing respirations. One sister was known to have hypertension; otherwise the family and past history were not remarkable.

Physical examination revealed nothing unusual aside from moderate cardiac enlargement, basal and apical systolic murmurs and a blood pressure of 200 to 220 millimeters systolic and 100 to 110 diastolic. The urine was normal.

Diagnoses: Essential (menopausal) hypertension. Hypertensive heart disease. Coronary sclerosis?

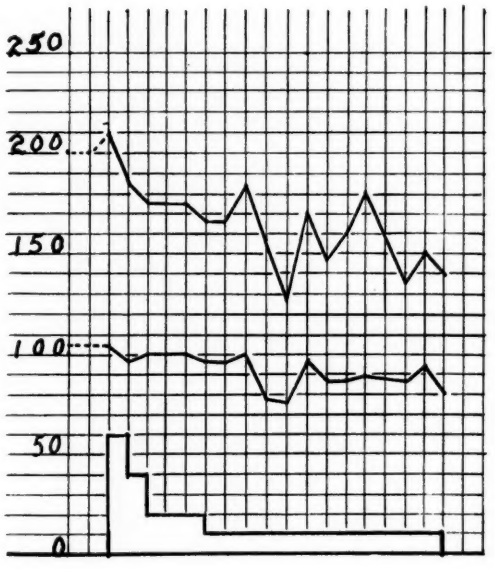

FIGURE 5. Case V. This figure illustrates the variable readings obtained from a patient suffering from essential hypertension of the menopausal type. The trend under sulphocyanate therapy is clearly downward.

Figure 5 shows the marked fall in blood pressure accompanying the use of potassium sulphocyanate. She was definitely improved subjectively. Such a drop in tension may or may not have resulted from the drug. At least it occurred during its administration.

COMMENT ON ILLUSTRATIVE CASES

Case one illustrates the effect of the drug in a patient with probable renal changes. A fall in both systolic and diastolic pressures accompanied

the administration of the drug and a rise in both readings followed omission of the drug. This patient also demonstrated the weakness which may be experienced when the pressure is reduced, an observation suggesting that the hypertension may have represented a favorable compensatory reaction.

In case two a comparatively slight effect was obtained. The patient was suffering from congestive failure and the renal changes were more marked than in case one. This patient also complained of weakness while taking the drug.

In case three we have a patient who suffered from anginal pain when potassium sulphocyanate was administered and was free from such symptoms when not taking the drug. The reduction of pressure may have been accompanied by diminished coronary flow, myocardial anaemia and angina pectoris.

Case four is that of a patient suffering from essential menopausal hypertension. Marked variations in the pressure occurred. No definite effects were observed directly ascribable to the action of potassium sulphocyanate. However this patient experienced marked subjective improvement.

Finally, case five showed a marked fall during sulphocyanate therapy with improvement in symptoms. Her hypertension was of the menopausal type. She gave a history suggesting angina pectoris but, contrary to our experience in case three, this was not made worse with a fall in blood pressure.

DISCUSSION

This series of cases, drawn from routine outpatient and private practice groups, falls mostly in the fifth and sixth decades when essential hypertension is usually found established and the blood pressure relatively less variable than when encountered early in life. It is conceivable that many of these patients, if seen at intervals, without treatment, might show similar reductions in blood pressure merely from being accustomed to medical observation. This may indeed be the case with those whose pressures remained low after the drug was omitted. On the other hand, such marked reductions as were obtained by the drug in a few cases in which a level had been established, especially when the effect persisted, and the rise and fall of the pressure with omission and resumption of the drug are evidence strongly supporting a hypotensive effect of potassium sulphocyanate. With regard to persistent effects after omitting the treatment, observers have shown that the effect of sulphocyanate may be prolonged. It may be that large doses or more persistent treatment in some of the cases showing little or no effect, would have brought them into the favorable group.

With regard to the mode of action of this drug we have no definite knowledge; it may act as a sedative especially affecting the vegetative nervous system and thereby relaxing peripheral vascular spasm.

The clinical diagnoses in the present series have not been helpful in determining which cases show a favorable effect. The symptom of weakness or exhaustion when taking the drug was noted in two patients who showed renal changes, one of whom was also quite arteriosclerotic. Of the four patients complaining of precordial distress or angina pectoris, two showed evidence of nephritis, one suffered from hypertensive heart disease with probable coronary sclerosis and the other from rheumatic and hypertensive heart disease with aortic regurgitation and mitral stenosis. However, the drug was used without harm in others with similar pathological changes apparently as great in extent. In cases where renal damage or coronary sclerosis is present, greater caution in the use of the drug should be exercised, the hypertension being perhaps a favorable compensatory condition in these cases.

SUMMARY AND CONCLUSIONS

Potassium sulphocyanate has been used by us in a series of fifty-nine patients, most of whom belong to the essential hypertension group, the majority being over forty years of age.

During the administration of this drug a reduction in systolic pressure of thirty or more millimeters of mercury occurred in forty-two per cent. of this series and a possibly favorable effect, though not so marked, in a larger percentage.

Unfavorable symptoms may, apparently, be produced by the sulphocyanate in patients with renal changes and in those with coronary sclerosis. The drug should be used with care in these cases. We have noted no alarming symptoms in any patient and believe the drug should be given a clinical trial in many cases where the patient is suffering from the effects of hypertension or is likely to suffer from these effects.

Further studies are contemplated to determine whether this therapy is of permanent value, and if so, in what cases.

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FUNCTIONAL DISORDERS OF THE COLON*

BY EVERETT D. KIEFER, M.D.†

ONE of the most common complaints which both the gastro-enterologist and the general practitioner are called upon to treat, and certainly one of the most common complaints in patients referred to the gastro-enterological department of the Lahey Clinic, is chronic constipation. For the large number of persons who have chronic constipation it may be considered a minor disorder, yet to a considerable portion of this group it becomes a real health problem. There is often associated with constipation a chronic ill health which materially reduces the individual's efficiency. We all know of patients who have subjected themselves to several operations in their effort to get relief from symptoms which we now know to be caused by functional colon disorders. For the emotionally unstable personality, the continued abdominal distress may be just sufficient to keep the patient in a continual state of nervous invalidism.

An inquiry into the nature of chronic constipation shows all degrees of variation from the normal bowel function. Some patients may have only one or two stools a week and not suffer from any distress, while other patients will claim that they are miserable unless they have a free and copious bowel movement each day. General experience indicates that probably the normal bowel function consists of the passage of one formed stool each 24 hours. However, there are many people apparently normal who have bowel movements either more or less frequently than this. More important than the frequency of the stools is their consistency. One of the chief functions of the large intestine is to extract water from its contents; therefore, if the fecal material passes through the colon at a speed greater than normal, the stool will be mushy and without form because insufficient water has been reabsorbed. If, however, the material remains too long in the colon, the stool will be dry, hard and crumbling. Consequently we may and often do get a history of periods of diarrhea interspersed with periods of colonic stasis.

The debilitated or exhausted patient frequently complains of constipation. This may be due to old age, but it often occurs in women after childbearing, or follows long illnesses, overwork and lack of sufficient food due to worry or other psychic disturbances. Often constipation seems to be a part of the syndrome to which patients refer as a "run down condition."

Another patient who is apt to be constipated is the nervous spastic individual. There is a certain tenseness or hypertonicity about these people that is characteristic: all of their deep reflexes are exaggerated; the pupils are apt to be wide; the sigmoid can be felt as a hard, tender, rope-like mass in the left lower quadrant; they perspire readily and are irritable and emotionally unstable. In other words, there are numerous clinical signs indicating an unbalanced autonomic nervous system. Pottenger[1] has discussed the autonomic innervation of the gastro-intestinal tract with a useful explanation of the symptoms apparently produced by improper balancing of sympathetic and parasympathetic influences, but the condition is by no means a simple one. Many constipation cases correspond closely to the type of cases designated by Eppinger and Hess[2] as vagotonics. In some individuals the symptoms of tachycardia, vasomotor disturbances, headaches, and perspiration are so outstanding that the associated constipation is obviously only one manifestation of autonomic imbalance. Boles[3] states that diet is a cause of constipation only in people with unstable nervous systems.

Migraine is frequently associated with constipation, and although the migraine patient may or may not correspond to one of the two types just mentioned, it is true that the association is too frequent to be merely coincidental. Marked visceroptosis is commonly associated with poor bowel function, not so much because of the low position of the abdominal organs as because of the susceptibility of the ptotic person to fatigue and exhaustive states.

The gross structure of the large intestines is subject to wide anatomical variation. Studies of post-mortem material by Bryant[4] have shown that the length of the colon may vary between three feet four inches and ten feet ten inches. Redundancy of the colon may be considered as an anatomical variation no more pathological than are the fish-hook or steer-horn types of stomach. It is often seen in the x-ray examination of cases of constipation because it offers a handicap to the bowel which is functioning poorly. However, it is not an insurmountable handicap, a fact demonstrated by the large number of colons of unusual length which function perfectly. If the neuromuscular tissue of the colon functions normally, it may readily overcome the handicap of greater distance through which the intestinal content must travel and the bowel function is unimpaired. The ptotic colon which lies low in the pelvis is another form of mechanical disadvantage which in most instances is entirely overcome by the well coördinated intestinal muscle. In other words, the mechanical handicaps offered by colons congenitally too long or too low are not often in themselves the causes of symptoms. Trouble arises only when the general condition of the

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patient is impaired and the smooth working of the conducting and contracting mechanism of the large intestine is upset.

Another essential characteristic of the colon is its irritability or its susceptibility to stimulation. In this characteristic, which is a constitutional or congenital quality, there is also wide variation. It is common knowledge that the same dose of laxative given to each of a group of individuals will cause all degrees of action by the bowels. The stimulus is essentially the same, but the different degrees of irritability are responsible for the various responses. Among the wide degrees of variation in colonic irritability there is a certain optimum range which is conducive to good bowel function. In the bowel which is understimulated, the action will be sluggish; but it is just as true and much more frequently the case that overstimulation interferes with proper function. Overstimulation may result in either a propulsion of the intestinal contents through the colon at a rate more rapid than normal with resulting mushy or liquid stools, or there may be an upset in the control of contraction and relaxation of the muscle fibres so that the "law of the intestine" does not operate efficiently and stasis results. Peristalsis in the large intestine is the result of an elaborate synchronization of contracting and relaxing muscle fibres. Whether or not Auerbach's plexus originates the rhythmic intestinal movements, Boles[3] believes that it can transmit stimuli which interfere with normal function. These stimuli apparently reach the plexus in the intestinal wall by means of the fibres of the sacro-bulbar division of the autonomic system. Prolonged overstimulation of the colon, such as frequent catharsis, is one of the most common factors upsetting the smooth working of this intricate mechanism and producing areas of atony and spasticity so arranged that stasis is the result. This condition is easily demonstrated by the x-ray examination with the opaque meal or enema.

Distinct from irritability is another characteristic of the colon which is its ability to respond to a stimulus. As in the heart, the force of the contraction depends upon the condition of the muscle fibres involved. Since in all muscle tissue, the strength of the contraction is related to the tonicity of the muscle fibres, the strength of the muscularis can best be estimated by observing the tone of the intestinal wall. Consequently, we can refer to this important characteristic of the bowel simply as tone. No doubt there are considerable congenital variations in intestinal tone, but most frequently the variations from normal are acquired. The muscular tone of the intestine is lost either through general debility of the entire body from disease, from malnutrition, from overwork, or from a more localized condition such as fatigue of the colon itself from prolonged overstimulation with cathartics, enemata, or roughage food.

Among the important congenital factors influencing bowel function is the psychic inheritance of the patient. For a long time functional colon disorders, particularly mucous colitis, have been associated with neurotic stigmata. The nervous spastic type of person has already been mentioned, and anyone who deals with a considerable number of cases with colon disorders is impressed with the high incidence of personalities of the so-called neurasthenic type. However, by no means do all of the patients with constipation fall into this group; for there are other factors giving rise to colon mal-function, and the attendant ill-health may be the cause of a neurasthenic condition. It is common experience that emotional crises have a marked influence upon the function of the gastro-intestinal tract; therefore it would be reasonable to expect that the person who lives in a constant state of emotional instability would have an abnormal bowel function. Until more is known of the anatomy and physiology of the autonomic nervous system, very little can be said of the exact mechanism by which the colon is affected by psychic influences. Whether the effect is brought about by nervous impulses or by hormone substances is unknown, but the action upon the colon appears to be one of increasing its irritability. At least this is a useful supposition, particularly in outlining treatment.

Although a constitutional variation is highly important, other influences, such as diet or drugs, frequently cause disturbances in bowel function. Foods have their effect by the bulk and irritating power of the residue in the colon. These two features vary widely in foods occurring in varying combinations.

When the problem of constipation confronts the layman, he is influenced by innumerable advertisements of drug houses and faddists, and turns to either coarse high residue food, to cathartics, or to both. Cathartics are, without exception, either mild or drastic irritants to the bowel. Even plain mineral oil, which has the properties of lubrication and softening of the fecal mass, is a foreign body and is therefore not without its irritant effect upon the colon. Practically all forms of the so-called cholagogues and liver medicines are disguised cathartics more or less drastic in effect. Enemata are also marked irritants; the degree varying from the least irritant of all, warm normal saline to the soap-suds or other highly irritant solutions. The quantity of the enema influences the degree to which the intestine is stimulated. High colonic irrigations are contraindicated in the treatment of the hyper-irritable or atonic colon.

Unfortunately the entire lay treatment of constipation consists of additional stimulation to the colon. If the constipation is due to insufficient stimulation, the addition of raw fruits, vegetables and bran to the diet usually produces the desired results; but if, as so often is the

case, the constipation is the result of hyperirritability, loss of tone, or both, increased stimulation will not only fail to relieve, but will aggravate the condition.

The clinical histories of many cases of constipation are enlightening and often characteristic. The following are brief synopses of typical case histories. Case No. 1 is characteristic of the nervous spastic type of person in whom a spastic sigmoid apparently interfered with bowel function. The continued irritation aggravated the spasticity, producing reflex symptoms in the stomach and elsewhere. When the irritating drugs and foods were withdrawn, the bowel recovered its normal function.

Case No. 2 is typical of the weak, exhausted individual who had belabored her colon until it became completely exhausted, as shown by the enormous dilatation. With rest and forced nutrition as the keynote of treatment, the bowel regained its normal function.

Case No. 3 is a migraine case with a bowel abused with cathartics until there was a marked loss of tone. The irritation in the colon apparently precipitated the migraine attacks, which, in the patient's mind, called for more catharsis, thereby producing a vicious circle. The correction of the bowel condition had a very favorable influence upon attacks of headache.

CASE 1. Male, age 43, a Hebrew business man, came to the Lahey Clinic in December, 1927, complaining that he had had severe constipation for fifteen or twenty years. For the last year it had been worse, requiring compound licorice powder every night, which kept all the stools mushy. Occasionally he would have an attack of headache, nausea, and vomiting lasting several hours until relieved by a bowel movement. At times he had sharp cramp-like pain across the lower abdomen, followed by a loose stool. His appetite was good, but food always caused immediate epigastric distress, gaseous eructations and flatulence. His diet contained liberal quantities of raw fruit and vegetables. He was subject to frequent head colds, but otherwise, except for an operation for hernia, his past history was negative.

The physical examination showed him to be well nourished. The blood pressure was 130/80. The tongue was coated. In the abdomen a full, tender cecum could be palpated. The rectal examination was negative. The gastric contents 45 minutes after an Ewald test meal showed a free HCl of 33 and a total acidity of 49. The blood and urine findings were all normal. Fluoroscopic and film examination of the gastro-intestinal tract showed a normal stomach with hyperperistalsis and slight spasm of the duodenum. In six hours the barium had reached the sigmoid and in 24 hours the colon was almost entirely empty of barium. A barium enema passed unobstructed through a narrow spastic sigmoid and descending colon over to a large, low cecum. After evacuation only faint streaks of barium remained in the colon. A Graham test failed to visualize the gall-bladder at the first attempt, but when the test was repeated, the gall-bladder appeared to function normally.

This patient was completely relieved of his symptoms by bowel management in the hospital, and several months later he reported that as long as he used discretion in diet he was entirely free of gastro-intestinal symptoms. The bowel function was normal without laxatives.

CASE 2. Female, age 47, an American housewife, came to the Lahey Clinic in September, 1927, complaining of marked general weakness and debility. Her health had been very poor for twenty years. During this time her bowels had been obstinately constipated, for which she had taken a cathartic every night and morning. The stools were always loose. She complained of much distress and tenderness in the abdomen, gaseous eructations, anorexia, bloating and flatulence. At intervals of one to five weeks she would have attacks of severe headaches lasting from one to three days, accompanied by prostration, vomiting and constipation. Both cathartics and enemata were ineffectual at these times. There had been a loss of seventeen pounds during the last few months. She was unable to do any housework. Her surgical history before entering the Clinic included an appendectomy with dilatation and curettage of the cervix in 1908, a resection of the nasal septum in the same year, a suspension of a ptosed right kidney in 1909, excision of hemorrhoids and an anal fissure in 1916, and a pan-hysterectomy in 1920.

Physical examination showed her to be of a ptotic asthenic type, markedly undernourished and weak. The lack of tone in the skeletal muscles was striking. The knee-jerks were weak. The blood pressure was 95/65. There was pyorrhea around most of the teeth. There was tenderness over the cecum and over the sigmoid, which was rigid and easily palpated. The gastric contents 45 minutes after an Ewald meal showed a free HCl of 32 and a total acidity of 51. The blood and urine examinations were normal. Film examination of the stomach showed it low and atonic. A barium enema passed unobstructed through a markedly dilated and redundant colon over to a low cecum. Much gas was present. About three quarts of barium mixture was required to fill the colon. After evacuation a small amount of barium remained in the lower pole of the cecum and in the lower sigmoid, but the rest of the colon showed only faint streaking. The gall-bladder by cholecystography appeared large but otherwise normal. Films of the teeth showed a large abscess at the root of the upper right central. The basal metabolism was -18.

This patient was treated for a short time in the hospital and kept under careful observation for several months. She showed gradual but marked improvement. Her weight increased 22 pounds. She gained tremendously in strength, becoming able to work quite hard. The bowels functioned normally without laxatives, and although the headaches persisted, they were much less frequent, much less severe and without vomiting or prostration. A barium enema examination in March, 1928, showed a rather spastic descending colon and a moderately dilated cecum. There was a striking decrease in the size of the colon, indicating a tremendous gain in tone.

CASE 3. Female, age 44, an American housewife, came to the Lahey Clinic in October, 1927, complaining of attacks of left-sided headaches accompanied by nausea, vomiting and prostration lasting from twelve to twenty-four hours, and coming on at intervals of from one to four weeks over a period of 21 years. She had never been very strong. She had had an attack of dysentery while in China, where she lived for five years, but for the rest of the time since childhood she had had constipation. She usually took a cathartic pill or mineral oil every night. Her menstruation was apt to be profuse and painful. She had never been pregnant.

Physical examination showed her to be fairly well nourished. The blood pressure was 145/85. The

cecum was palpable and tender. The liver and spleen were slightly enlarged. The deep reflexes were all hyperactive. The gastric contents 45 minutes after an Ewald meal showed a free HCl of 55 and a total acidity of 70. The blood and urine examinations were normal. Fluoroscopic and film examination of the gastro-intestinal tract showed a normal stomach and duodenum. In six hours there was a very small residue in the stomach. The head of the meal was in the transverse colon. A barium enema passed very rapidly through an extremely redundant and dilated colon over to a low cecum. After evacuation there was considerable barium remaining in the entire colon. Haustral markings were deep in the transverse portion but absent in the distal part. The Graham test showed a normal gallbladder.

With hospital bowel management followed by careful dieting, this patient showed marked improvement in her general condition. The bowel function became entirely normal without laxatives of any form. While she did continue to have some headaches, the attacks were comparatively mild, and occurred at long intervals. A barium enema examination in March, 1928, showed a marked increase in tone over the previous examination.

There are, of course, many variations in the histories and symptoms. The chief complaint is very frequently not constipation but is abdominal pain and distress after taking food. The chief characteristic of the pain is that it tends to be shifting, but may be localized in the epigastrium or in the gallbladder or appendix regions. Not infrequently there is a history of a previous cholecystectomy or appendectomy without relief. The pain usually comes on either immediately after meals or three or four hours later. It is not relieved by food or by soda, but is partially relieved by hot drinks or by the application of heat to the abdomen. The patient usually complains of much belching, intestinal flatus and gurgling noises in the abdomen. The symptoms found in these cases have been enumerated and discussed by Jordan and Kiefer.[5]

The examination of the patient should be general and thorough, with the object of finding out everything that is wrong so that it may be corrected. The rectum should be examined for hemorrhoids, painful fissures, and contractions of the anal sphincter.

The character of the stools should be determined because abnormal stools indicate abnormal bowel function. Most of the cases have mushy stools nearly all of the time. Mucus is frequently present and indicates excessive irritation of the bowel. There is no distinct difference between mucous colitis and the more common forms of functional colon disorders. The secretion of mucus is a common reaction of an overstimulated bowel and the difference is one of degree only.

A gastric analysis is often useful in detecting an achlorhydria, which appears to be a frequent and important finding in cases of functional colon disorder.

The x-ray examination of the gastro-intestinal tract is very important and should not be omitted for two main reasons: first, the symptoms of colonic disorders frequently simulate organic disease, or may mask the symptoms of organic disease, which is present coincidentally. Second, the x-ray, particularly with the barium enema, is useful in estimating the gross structure of the bowel, its tone and its irritability.

In the fluoroscopic examination of the colon with the opaque enema, it is obvious that one should look for organic obstruction, filling defects, displacements or abnormal fixation, redundancy and ptosis. Besides these, there are other important points of observation which are helpful in estimating the functional condition of the colon. For normal colons, there is a characteristic rate of filling when the enema solution is injected under a given head of pressure. A hyper-irritable colon which has good muscular tone will appear spastic and the rate of passage of the enema will be slow. If there has been considerable loss of tone, the enema will fairly shoot through the intestine as far, at least, as the splenic flexure. There is not enough resistance to the passage of the fluid to cause a distention of the gut, and the stream is characteristically quite narrow until it is well over to the right side, when the atonic intestine begins to be distended. The amount of this distention is sometimes very marked, so that the very atonic colons hold three or more quarts of barium solution. Complaints of pain by the patient while the colon is being filled denote hyperirritability.

A film taken of the colon after the enema has been expelled will also help in estimating its irritability and tone. The normal colon is not greatly stimulated by the bland barium solution, so the barium is not usually entirely expelled. The hyper-irritable colon will endeavor to expel the entire enema and the common appearance of the colon after evacuation is that of a feathered line or a straight string. Even the colons which have lost considerable tone are able to expel the liquid contents thoroughly after the enema, although they have difficulty in evacuating the more solid normal fecal mass. The markedly atonic bowel may show an incomplete evacuation of liquid barium solution. A disordered synchronization of muscular contractions is frequently demonstrated in the film, as well as at the fluoroscopic observation, as areas of marked contraction interspersed with areas of atony. Often the left side of the colon is shown to be in spastic contraction, apparently preventing the filled atonic right side from emptying.

In the outlining of treatment for these cases, there are three main considerations: first, the condition of the colon; second, the general health of the patient; and third, the emotional or psychic influences present.

In a case of sluggish bowel function in a strong young person, with a normal appearing colon at x-ray examination, the increase in the

stimulation of the bowel by adding raw fruit, vegetables and bran will bring about the desired result.

If the colon is hyper-irritable and shows evidence of loss of co-ördination in the muscular contractions, the function will be improved if a non-irritating diet with a moderate amount of bulk is prescribed. Other facts which influence the irritability of the bowel, such as emotional excitement, worry, or psychic maladjustments, should be eliminated, if possible. It is essential to withdraw completely laxatives of all kinds.

When there has been loss of tone of the bowel, rest must be the keynote of the treatment. The bowel must be rested by withdrawing all irritation and the diet should be small in residue and non-irritating. As the tone returns, the residue in the diet may be gradually increased and more stimulating food included. Particular attention should be given to building up the patient's general condition. This usually means plenty of rest and food. Very often it is necessary to put the patient at absolute rest in bed for one to two weeks. Hospitalization is the only satisfactory method in nearly all cases requiring bed treatment. They are started on a non-irritating, moderately low residue diet, to which are added from time to time foods which gradually increase the bulk and irritation of the intestinal content. An accurate record of the size and consistency of the stools should be kept and when the stools have become formed and the patient is free of abdominal distress, additional bulk may be included in the diet. If the additional bulk is well tolerated, that is, if the stools remain formed and there are no cramps, more and more bulk may be added, including foods which have increasingly more stimulating effect upon the colon. Stewed fruit may be increased to three times a day if the bowel function is sluggish and the stools formed and hard. If, however, the stools are mushy, it is not wise to increase the diet rapidly. The increase in residue diet is made entirely on the individual progress and not according to any routine schedule. The soothing effect of heat upon the bowel is taken advantage of by having the patients drink hot water and by applying external heat to the abdomen. Atropine or belladonna seem to help to re-ëstablish proper function, probably by the depressing action on the parasympathetic nerve endings. Of course during the first few days of treatment, the bowel function is irregular and unsatisfactory. The principle of rest and non-irritation is followed and as little as possible is done to induce evacuations. If there has been no movement in 48 hours, about three ounces of warm cottonseed oil should be instilled into the rectum to be retained over night. If the oil does not induce a movement, a small low enema is given. Fecal impactions of the rectum have to be watched for and avoided by the use of oil injections. Frequent rectal examinations are necessary in order to prevent impaction and to help in determining the rate of progress. Patients who have had only liquid or mushy stools for a long time are apt to have difficulty in expelling the first few formed stools because of a chronic contraction of the anal sphincter. It is usually unnecessary to dilate the sphincter mechanically, good results being obtained by gradually increasing the consistency of the stools until the sphincter becomes normal again. It is necessary to give the patients plenty of encouragement. Many also need help in adjusting themselves to various psychic disturbances in their lives. Nearly all need to be re-ëducated so that they will put aside the fear of auto-intoxication and allow their bowels to function normally. It is often necessary to explain to them why their constipation is being treated with foods which they have always considered to be constipating. Certain habits need to be corrected, chief of which is belching. The eructations of gas can be controlled by the patient if he will, and he should always be encouraged to do so. Unless they are told, most patients start treatment with the idea that it is a virtue to raise as much gas as possible.

Other forms of medication are sometimes necessary because the improvement of the patient's general condition is extremely important. Foci of infection should be eliminated, anemia, if present, should be treated, and the control of insomnia with sedatives is often helpful. Dilute hydrochloric acid in doses of one dram with each meal is very important if achlorhydria exists. In many cases with gastric distress and normal or increased acidity, it is helpful to administer alkalies after each meal. For the undernourished patient the caloric intake may be enhanced by giving a mixture of one-half milk and one-half cream (not cold) between meals.

When the patients leave the hospital, they should be instructed to adhere strictly to the same diet and continue the routine of drinking hot water. Laxatives of all kinds and large enemata are forbidden. Patients should be taught how to use a small rectal syringe which has a capacity of two or three ounces, so that they can administer to themselves rectal injections of oil when it is necessary. Vacations, recreation and general hygiene are, of course, important.

In most cases it is necessary for the patient to adhere to the strict regime for several months. Additions to the diet can then be made. In general, since the underlying hyper-irritability of the colon is usually a constitutional condition, the patients can never absolutely disregard their diet. Many patients report months and years after treatment that if they follow the rules of diet, they have no symptoms, but if they eat much roughage, they immediately have

trouble. Consequently, recurrences are precipitated by dietary indiscretions, worry, acute infections, overwork and intercurrent disease.

SUMMARY

Functional colon disorders are common, important, and in general poorly understood.

The condition is apt to be found in patients who have a functionally unbalanced autonomic nervous system, which is frequently accompanied by a nervous temperament. Other commonly associated conditions are general debility and migraine. Habitual catharsis also is an important etiological factor.

Loss of tone is the result of fatigue of the bowel or poor general condition of the patient.

Overstimulation of the colon comes from the use and abuse of coarse foods, laxatives and enemata.

Hyper-irritable spastic colons may, through the prolonged use of cathartics, become atonic.

The redundant and ptotic colons do not usually cause trouble until there is a loss of power in the intestinal muscle, or a disturbance in the neuromuscular mechanism.

Patients with migraine usually have hyper-irritable colons and are subject to loss of tone and poor bowel function.

The examination of the patient should be general and thorough, including a rectal examination.

Laboratory examinations of blood, urine, stools and gastric contents are important and helpful.

The x-ray is necessary to rule out organic disease and to estimate the condition of the colon. Abnormal variations in irritability and tone can be demonstrated with the barium enema.

Treatment consists of eliminating the overstimulation, allowing rest for the bowel and building up the patient's general condition.

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INDUSTRIAL HERNIA*

BY EDWARD L. YOUNG, JR., M.D.†

A NUMBER of years ago, the condition which was popularly called "railroad spine" caused a great deal of difficulty for the medical profession in their attempts to estimate accurately the true amount of damage sustained by any individual, because it was impossible to say just how far the patient's symptoms were real, how far they were imaginary, and how far they were influenced by the legal aspect of the question, which so often played an important part. In fact, it was not unknown to see a remarkable recovery shortly after a verdict had been given and crutches, previously indispensable, discarded almost in the court room.

With the development of modern industrial insurance, the status of hernia has become of similar importance. There have been many commissions appointed to settle the question of what constitutes a hernia due to work and, therefore, to be paid for by the insurance, and many very able surgeons have expressed themselves on one side or the other, but as yet there is no fixed and recognized etiologic factor or factors which will allow a definite classification of this condition. We are told that anywhere from one-quarter to one-half of all males are born with a condition of the inguinal canal which amounts to a potential hernia. This potentiality cannot be recognized and, accordingly, the development of a hernia may or may not be due to any unusual factor in daily work, depending on the degree of weakness which the patient possesses as a congenital factor. There are also many other conditions which can give pain in the groin, which do not show themselves as clean-cut clinical entities. Because of these various indefinite factors, it often happens that a workman will report for pain in the groin either with the preconceived idea that it is a hernia or, still worse, will be told that it is such by the examining physician. There seems to be a feeling almost of shame on the part of many physicians in not being able to feel a hernia when a patient complains of pain in the groin and accordingly, such terms as "potential hernia", "early hernia", "weakness of ring with beginning hernia" are used which, far from reassuring the patient, only serve to make matters worse. Also it is not sufficiently recognized that there are other definite conditions which cause pain in the groin and must be considered in differential diagnosis. It has become such an important problem in industrial insurance that the term "industrial hernia" has been applied to this whole group.

Three years ago, Wesson of San Francisco wrote a paper on "Industrial Hernia vs. Seminal Vasiculitis and Vasitis", which called attention to this problem and offered one explanation. His article was based on forty-seven cases, most of them referred by insurance carriers, where

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†For record and address of author see "This Week's Issue," page 737.

hernia operation had been advised, and in all of these the actual condition was vasitis and not hernia. On the basis of this report, I began studying all of the cases with pain in the groin which I could find and had referred to me all of such cases coming to one of the large insurance companies. During this time I have seen twenty-four cases and they group in an interesting fashion but in a way different from the report of Dr. Wesson.

To take up first those cases which meet his group of infections in the genital tract, there were only three which I found. They are as follows:

T. H., 37, married, laborer. Three months ago, patient had five days' work in a large drain pipe. It involved working in a bent position. It was hard work and he felt that he strained his abdominal and back muscles. He began to have a pain in the left groin. No other symptoms. He continued to work, although the pain bothered him, until two weeks ago, when he began to have some swelling of the left testicle. He had, up to that time, been told it was a strain with early hernia. The swelling of the testicle was considered a separate thing. When seen, he had a negative urine, a thickened epididymis, a slightly sensitive cord, but no hernia present. The prostate was only slightly boggy, with a few pus cells. Under proper treatment, the condition entirely disappeared and there has been no further question of hernia since.

F. G., 60, laborer. His complaint was pain in both groins, worse on the right. Operation January 1925 for right inguinal hernia; no sac found. Operation for left inguinal hernia in June 1925; no sac found. Operation April 1926, a recurrent hernia on the left. The three operations did not cure. On examination there was a marked prostatitis and treatment of the prostate always brought on the pain for which he had been operated.

M. J., 47, business executive. At 27 the patient had a right colon pyelitis. This apparently cleared up. Following this, he began to have pain in the right groin. Study at that time failed to reveal a hernia and accordingly he had an appendectomy because the diagnosis of chronic appendicitis is made almost as frequently as the diagnosis of hernia and with as little justification. The pain was in no way altered by the removal of the appendix and when I first saw him, there was a definite colon bacillus prostatitis without infection in either kidney. Since that time the pain in the groin has been to a large extent an indicator of his general condition. Under treatment the prostatitis is relieved and if he gets tired out and run down from overwork, the pain will recur and he will come in for more treatment.

The second group includes both men and women and is made up of those who have the onset of pain following some definite and generally rather unusual exertion. At the time they were first examined, there was no hernia present, so far as careful overhauling could demonstrate, but all of them developed hernia within six months without any further unusual exertion being present. The following is a good example of this group:

C. C., 68, male. He had reported to me for various minor conditions over a period of ten years. During that time I had examined him on numerous occasions and I am sure that there had been no hernia. He was doing some work to which he was not accustomed, one day, chopping stumps and doing heavy lifting, and following this, he had a pain in the groin which bothered him enough so that he came for a check-up. I was unable to demonstrate any hernia or even weakness of the inguinal ring. Three months later he again reported and there was a definite small hernia.

The third group is closely allied to this and consists largely of younger individuals, generally males, where the pain occurs either during or immediately following some unusual exertion or strain, but where there is no later development of hernia. The following is a good example of this type:

F. C., 32, male, teamster. He was loading heavy sacks onto a truck with another man. His partner stumbled and he got the whole weight of the sack while he was in a strained position. This caused an immediate disabling pain in the right groin. This at once prevented his working and continued to bother him up to the time I saw him, several days later. Careful examination failed to reveal any hernia. He was told that it was a strain and was put on lighter work for a short time and then back to his old job. When seen a year later, he had not developed any hernia and was not conscious of any discomfort.

Although generally in the male, it is not always so, as for instance:

Miss L. P., 32, teacher of acrobatic dancing. While demonstrating one part of the work which involved touching the back of her head with her heels while jumping in the air, she felt a sudden sharp pain in the right groin. This has bothered her ever since and has definitely limited her ability to work. Examination shows no evidence of hernia. This was treated as a strain and two years later there was no development of hernia.

This was the largest group of cases in the series and it seems to me is one of the most important. If the patient will accept the dictum that a strain is present, just as other muscles may get strained and cause pain, and is able and willing to get back gradually, he or she will be able to resume normal occupation in a relatively short time and nothing further will be heard from it. If, on the other hand, he is started off in the wrong direction by being told that it is a "potential hernia" or "almost a hernia", or otherwise frightened, a neurosis may be engendered which may lead to very bothersome consequences.

There are two other small groups probably not of great importance but nevertheless extremely troublesome. The first occurs in either sex in the neurotic individual in whom some slight trauma has started a chain of symptoms and because of the individual's psychoneurotic tendencies, that chain of symptoms persists without any adequate physical background. In this case it is not possible to lay the cause to a persistent strain or damage to the muscles or to any infection. The best way to handle this type of case that I have been able to devise up

to the present is to refer the patient to your worst enemy. The following illustrates the type:

Miss N., 18, enamel worker. The year before I saw her, she had been studied in the hospital for pain in the right groin. Everything possible was done from laboratory examinations to special consultations. The only thing of localizing importance was persistent tenderness over the cecum. On that basis the appendix was removed. As is often true in this type of individual, she was better for a short time and then began to have the same pain again. She came to the hospital a second time and was put through every possible examination, including that of a psychiatrist, which was the only examination not made the first time. When I last heard from her, she was still under his care as he felt that she had certain definite stigmata of hysteria.

Four cases reported with pain in the groin following operation for a definite hernia. In all cases the pain was intermittent, in one case sufficiently bothersome to prevent work when it was present. This last case was cured, however, by an alcohol injection of the ileo-inguinal and ileo-hypogastric nerves.

Taken as a whole, this group has been of great interest and has pointed out the large number of different conditions which may be present when pain in the groin is the prominent symptom. It emphasizes the need of careful study and the great danger of using the word "hernia" or "rupture" when it is not entirely proven, inasmuch as in many patients it starts a chain of mental trauma which is very hard to eradicate later. This study has also demonstrated that there is in a certain part of the medical profession, and it would seem a rather large part, a great reluctance, when examining a patient with pain in the groin, to say that they cannot find a hernia, as though it were an admission of lack of skill; and that consequently a diagnosis is made of "probable hernia", "potential hernia", or "beginning hernia", which is not only not justified but, as stated above, may work considerable damage.

It is demonstrated very clearly, I think, that there is a condition of strain which does not necessarily result in hernia and which will, if properly treated, quiet down and cease to give further trouble. The patients to whom this was explained showed a great readiness to accept the situation as such, where their minds had not been prejudiced by the previous erroneous diagnosis of hernia.

From this study it seems to me important that there should be a wider recognition of the variety of the conditions which may cause pain in the groin and a greater caution in making the diagnosis of "hernia" in doubtful cases.

I wish to acknowledge the co-öperation of the American Mutual Liability Insurance Company in referring a large number of these patients to me for study.

THE WORLD'S PHYSICIAN

Gorgas Memorial Institute at Washington, D. C., Observes 75th Anniversary of Birth of William Crawford Gorgas

October 3 commemorates the 75th anniversary of the birthday of one of the great chevaliers of medical science—William Crawford Gorgas, physician, sanitarian and army officer, who freed Havana and the Panama Canal Zone of yellow fever.

The Gorgas Memorial Institute, with headquarters at 1331 G Street, N. W., Washington, D. C., founded to honor the name and achievements of Dr. Gorgas, makes the announcement that during the past year the two-fold purpose of Gorgas, Health Education and Research, has been carried forward in an active program which has benefitted directly and indirectly the profession of which he was a member.

The program of Health Education has been accomplished through several mediums: the press, the speaking platform, the radio and through high school essay contests. Many physicians have aided in the performance of this great Health task. Some have written health stories in terms of lay English, which have been released through the regular publicity channels of the Institute; some have assisted the Speakers' Bureau of the Gorgas Headquarters in arranging opportunities for the caravan health speakers; some have written medical articles for radio release, and a few have been of material assistance in bringing the high school essay contest, conducted during the past year, to the attention of the schools of their respective cities.

The records show that the following States have heard the Gorgas Message of Preventive and Scientific Medicine from the speakers' platform during a period of a little more than a year: Delaware, Florida, Illinois, Iowa, Ohio, Massachusetts, Michigan, Minnesota, New York, North Carolina, Virginia, Washington, Oregon, Pennsylvania, Kentucky, Indiana, West Virginia, Vermont, New Hampshire, Maine, Connecticut, Georgia, South Carolina, Arizona, and California—a total of 25 states. A total number of 454 talks have been made by caravan health speakers, with a total known audience of 146,246. Health Corps have been organized in 72 cities, 40 newspapers have been added to the Gorgas syndicate, 3,830 health posters stressing the importance of the periodic health examination have been distributed and displayed, 5 special radio talks have been made in addition to the regular weekly radio health talk which is made over 22 of the leading stations of the country, and a special health film has received 55 showings to an estimated total audience of 29,243. A field program of this size has been made possible largely through the generous financial contribution of the Metropolitan Life Insurance Company.

A very successful high school essay contest was conducted during the past year in which 1 out of every 100 high school pupils in junior and senior classes submitted an essay on the subject "The Life and Achievements of William Crawford Gorgas and Their Relation to Our Health." One of the chief phases touched on in this contest was that of the necessity of regular periodic health examinations by the family doctor. The local prize winners received

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MASSACHUSETTS MEDICO-LEGAL SOCIETY

REPORT OF A CASE OF ADMITTED MANSLAUGHTER*

BY FRED D. JONES, M.D.†

IN the absence of Dr. Schneider, Dr. Fred D. Jones of Springfield spoke on "Report of a Case of Admitted Manslaughter".

This was a homicide case of a male infant 3 years old and interesting from the fact that the child was away from home a long period of time without anybody apparently realizing the fact that the child was missing.

One day, about the middle of March, some children were playing near a dump and noticed a body partially protruding from a cask about one-half way down a very steep embankment. The body was brought into the undertaking parlors and presented the following facts:

The body was partially charred as the result of fires which were held at the dump; also a large amount of tissue over the crest of the ileum on the right side and extending into and involving some of the abdominal viscera was gone as a result, probably of rats gnawing at the body; these areas were scalloped and gave the impression of the teeth marks of some animal; there was no inflammatory reaction around these teeth marks and also no evidence of inflammation or blistering around the charred areas.

I performed the autopsy and, other than the marks due to animal bites and charring from the fire, the body was in a very good state of preservation. Apparently, soon after death, the body was put in the cask and placed in this dump and, as it was there three months during the cold part of the year, of course, the body was in a good state of preservation; there was no greenish discoloration from the abdominal viscera outside of the charring.

The signs of violence were: compound fracture of the lower jaw, just at the right of the median line, and two central incisor teeth missing. About the area of fracture was evidence of trauma previous to death, that is, ecchymoses and inflammatory process throughout the tissue.

The history is rather interesting. A man was living, or boarding, in this family while the husband was absent. He was more or less of a mentally deficient individual and became incensed over the doings of the little child, so one day he maltreated this boy. We do not know whether he picked the boy up and threw him down against the floor, or what kind of violence produced this fracture, but the point is that the man became enraged and hit the child, then put him to bed. The child did not die for three days. Of course, the family immediately became frightened, and instead of calling in a physician, they thought they would dispose of the body and took this way of doing it—put it in a cask and threw it over in the dump.

A charge of manslaughter was made; the man pleaded guilty and was given 8-10 years and the woman, the mother of the child, was sent to the Sherborn Reformatory.

The child, by the way, was reported, in December, to have left home and was said to be staying with an aunt; apparently that was the time when this took place. The child was not missed from that time until the body was found. After the body was found, a check-up was made of all the children of the town; it was discovered that this little boy was supposed to have been staying with an aunt, but on close check it was proven that this was not true and the body was identified.

The cause of death was given as follows: "Shock; compound fracture of jaw with accompanying shock and neglect." Of course, it was shock that really killed the youngster.

The question arose as to whether the compound fracture occurred before death or happened in the process of trying to get rid of the youngster by putting him in the barrel, but the histological examination of the tissues showed inflammatory evidence of it having been done before death.

Discussion

QUESTION: What evidence did you have that the child died before being put in the cask? Did you take the word of the mother?

DR. JONES: The history was that the child lived about three days. On the date of death, instead of calling in a doctor, they became frightened and put the child in the barrel.

QUESTION: It was their word that the child died before it was put in the cask?

DR. JONES: There was no evidence of asphyxia. There were no petechial hemorrhages through the pericardium, pleura, or conjunctiva, or in the organs of the neck; therefore there was no evidence of asphyxiation. If the child had been put into the barrel previous to death, I think there would have been evidence of ecchymotic areas over the body and that would have given more clew. Apparently there was not any ecchymosis on the body to give a clew that death followed putting the child into the barrel, although I think it could be possible.

QUESTION: May I ask in what condition you found the brain?

DR. JONES: The whole body was in a very

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†For record and address of author see "This Week's Issue," page 737.

good state of preservation. The brain had not liquefied; the convolutions and sulci were easily made out. The brain was not firm; it was more soft than the normal brain. There was no subdural hemorrhage and no laceration of the brain or brain tissue.

DR. GETTLER: In this case you said the child was burned. In a case like that lawyers would say, "How do you know the child did not die in a fire or from smoke?" So we always determine the carbon monoxide in the heart to rule out the possibility of the death by carbon monoxide.

DR. JONES: Would that be of value after three months?

DR. GETTLER: Oh yes.

DR. HUNT: How is that test done?

DR. GETTLER: That is prepared fuchsin reduced by sulphuric acid.

CHEMICAL EVIDENCES OF ALCOHOLIC INTOXICATION AND THEIR MEDICO-LEGAL SIGNIFICANCE*

BY ALEXANDER O. GETTLER, PH.D.†

FROM what I have been listening to, it seems to me that you are having more trouble than we; by that I mean the medical examiners' system of New York City. I think the majority here do not know that we have no medical examiners' system in New York State; we only have a medico-legal system in New York City and the last two years we have had one in Westchester County.

As to prices for autopsies, I do not think our medical examiners get any more than is the case in Massachusetts. They are on a salary. The assistant medical examiners get $4000 a year and very few of them can practise as they do not have the time; they are on duty 12 hours. They do about two autopsies a day, sometimes four; they average two, so that they do about 700 a year and for that they get $4000 a year, which means $6 a case. They go to court and testify for nothing, so we are just as badly off as you are.

As an introduction to this paper, I want to say a word about my department, that of toxicology and chemistry. The department consists of myself, the toxicologist and one assistant who gets $100 a month; he is simply a boy, still studying chemistry.

All autopsies in Manhattan are done in the building in which I am located. The organs are removed and simply taken two flights up. Outside of Manhattan the autopsies are done in the respective boroughs and the organs are shipped to the Manhattan Building. If there are any special cases which we think will be of great legal importance, then I have to go to Queens, Brooklyn, the Bronx or Staten Island and attend the autopsy.

Chemically, we analyze in this department about 1600 cases a year. I do not know how many of you here know how time consuming chemical work is. Alcoholic cases, cyanide cases, or suicide by lysol or arsenic do not take very long, but when you have a case where no clue is given, it may take two or three weeks.

We have had 1600 cases a year, which, I have had to do with a student assistant. In addition to that work, I endeavor to do some research work.

How is it possible to do research work? That is just what came to my attention this last year. The National Research Council is making an investigation of the medico-legal affairs of the United States. Curiously enough, they are investigating New York and Boston. I told them that they ought to investigate the rest of the country because New York and Boston are perhaps the only two which are doing a great deal medico-legal and chemical work.

Dr. McNeil, one of the members of the National Research Council, told me that a certain medical man in New York remarked that the medical examiner system is all right in New York, but that no research work is done; with all that vast material they have, they ought to do a lot of research work. So I wrote Dr. McNeil, telling him it was perfectly true we had the material but outlining to him the vast amount of work which we have to do. I told him the question should not be "Why so little research work?" but, "How is it that they have been able to do any?" Since 1918, when the office started, I have been able to publish about twenty papers.

For this afternoon, Dr. Hunt has asked me to say a few words on alcohol and its relation to intoxication.

Ever since the medical examiners' system was started in 1918, one of the questions most frequently asked in the courts and by the compensation referee is, "Was this man intoxicated at the time of the accident, or at the time of the murder?" "Can alcohol have had any bearing in accident cases?" If the matter of alcohol enters into the case at all, that question is always asked. If alcohol is found, "Can you say this man was intoxicated or not?"

For the first few years, I could not answer these questions. I found alcohol in the liver and

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†For record and address of author see "This Week's Issue," page 737.

brain, but could not say whether, with a certain amount of alcohol, the man was intoxicated or not. That is one of the problems I kept before me in working through the various cases and I have been able to come to a definite conclusion. The following two articles outline the methods. "The Alcoholic Content of the Human Brain, and Its Relation to Intoxication," reprinted from the *Archives of Pathology and Laboratory Medicine*, February, 1927, Vol. 3, pp. 218-226, and "The Quantitative Determination of Ethyl Alcohol in Human Tissues," reprinted from the *Archives of Pathology and Laboratory Medicine*, January, 1927, Vol. 3, pp. 75-83, one on the method and the other on the intoxication relation of alcohol.

Now I think I will say a few words on the method: I studied, and tried out, all the methods that could be found in the literature relative to the manner in which alcohol can be determined in small amounts, and I divided them into six groups. The alcohol we get from these cases is very small. It is not as if we were analyzing 10% alcoholic solution. We could then use specific gravity methods, but we cannot do that for these small amounts. That is one thing to bear in mind, the amount of alcohol we get is very small.

The second point, that in distilling the organs there are always other volatile substances which distil over; what they are has not yet been worked out.

The various methods which have been used for determining the alcohol are divided into six groups. The first group is based on the oxidation of the alcohol by sulphuric acid and potassium dichromate. Alcohol is the reducing agent. Dichromate has an orange color and when it is reduced by the alcohol it becomes green; there is change of color. One set of methods depends upon that. Nicloux method, for instance, depends upon the oxidation of the alcohol, observing and measuring the color changes. I found that methods based upon this are not good because the other volatile substances will reduce this dichromate and therefore give wrong results.

I might say, at this point, that at the last meeting of the American Chemical Society in Washington, a paper was read on determining alcohol in living people, trying to determine intoxication. The subject blows expired air into dichromate solution and the color changes are measured. I am not ready to criticize the method or results, because we have been working in New York for two years on just that problem, trying to find out what method we can use on live people. We are attacking the problem, I might say, through the spinal fluid, rather than through the breath, because the spinal fluid is most closely related to the brain.

I maintain that one cannot tell intoxication from the alcohol content of the brain. I might take some alcohol, rinse out my mouth and get a wonderful dichromate reaction, but I am not intoxicated because the alcohol has not reached my brain.

The second set of methods is based on the oxidization of alcohol to aldehyde and then treating it with reduced fuchsin, a red color develops. This second class of methods depends upon color changes, the more red, the more alcohol. Methods based upon this are not absolutely accurate, for the reason that when you oxidize alcohol, you get aldehyde but you also get acetic acid and carbon dioxide. When you oxidize, you get three products and you never know how much of one you have and how much of the others.

Another class of methods depends upon the formation of iodoform. Many of you know that we can get iodoform from other substances than alcohol.

The fifth class was introduced last year by two Germans, Fischer & Schmidt. They converted the ethyl alcohol into ethyl nitrite. When that paper was published, I thought a great discovery had been made. We tried it out, and found it to be very unreliable.

Lastly, a class of methods which tend to oxidize the alcohol not to aldehyde but to acetic acid. When we first attempted this, we got very poor results, but finally we mastered it by using requisite amounts of potassium dichromate and sulphuric acid. If we use different amounts of potassium dichromate, we get different results, higher or lower. This action is due to the difference in oxidation, but we have studied the amount of sulphuric acid which gives the maximum yield, 87%, and it is regular, when done in a certain way with a certain amount of reagent. The method in short is this:

We take the organ at autopsy whether it is brain, liver, or lung, and put it in a glass jar. It is put in the ice box to get cold and when ice cold, we take 500 grams and grind it up quickly. Then put it into a distilling flask, 600 c.c. of water added, acidified with tartaric acid and distilled with steam. That steam distillation drives off all the alcohol and we get a clear solution; 800 c.c. are collected. We found that if we collect 600 c.c. we get sufficient, but to make it doubly sure, we collect 200 more.

Of that 800 c.c. which contains the alcohol, we take 300 c.c. add 20 grams of dichromate and 40 c.c. of concentrated sulphuric acid. This distillation must be very slow; it should take 45 to 50 minutes; if it distils too fast, you do not get good results. After we have this distillate of 250 c.c., which now contains the alcohol in the form of acetic acid, we titrate it. We have done over 6000 alcohol cases.

Now for a much shorter method, which is not as accurate, but which gives a very good approximation. This is the reduced Fuchsin method, which is much quicker. I can tell by this method, which can be done in ½ hour,

whether a man has a very small amount of alcohol or a large amount. The organ is distilled with steam. Then we take a spiral copper wire. I make this of a uniform size. We heat this red hot with the Bunsen burner and plunge it into some of the distillate in a test tube 10 times. We have a uniform method, although we do not carry it to as fine a point as in the regular method, which takes 3 or 4 hours. This procedure converts the alcohol into acetaldehyde.

After we have it oxidized with the spiral, we add the reduced Fuchsin solution. Then we let it stand 3-5 minutes and notice the different depth of red. The red color is compared with four known standards. We call these 1+, 2+, 3+ and 4+. The 4+ corresponds to 0.6% of alcohol in brain tissue; 3+ corresponds to .4%, 2+ corresponds to .25% and 1+ corresponds to .1%.

This method can be done in ½ hour and is a very good approximation. I can approximate the alcohol content from the red color produced. If there is no alcohol present, no red color is produced.

The second matter for consideration is the alcoholic content of the human brain and its relation to intoxication. Can we, from the alcohol content, tell whether a man is intoxicated or not? The organ to be analyzed is the brain, because alcohol effects it primarily. If the stomach content is analyzed, the alcohol may not have been absorbed and therefore it has not reached the brain. A man may have any quantity in his stomach and not be intoxicated. Another man may have very little alcohol in his stomach and be intoxicated. We believe the brain is of first importance in determining the state of intoxication, after that the liver.

A question may be raised, is there any alcohol present normally? That question has come up for years and years. Some workers say there is alcohol and others there is not. The reason of this controversy is simply because of inadequate and non-specific tests.

Each and every one of the tests used is not specific for alcohol, so we do not know whether the normal human individual has alcohol in the liver or brain. By this method we also find that there is a small amount of reducing material which comes over in the distillate, but we cannot prove to date that this is alcohol. That is one of the problems I have in mind, trying to prove whether this trace of volatile reducing material is alcohol. My method simply shows that the normal brain will give a small test to this more accurate method. The amount of alcohol (if it is alcohol), is very small, 0.002% in the 1000 grams of brain.

The third point, what is the alcohol content of the brain of partakers? A chart was exhibited which shows that a "trace" of alcohol means 0.005 to 0.02%. The normal reducing power of brain distillates is .0002.

Then a classification of four divisions has been made into 1+, 2+, 3+ and 4+. So the amount of alcohol in partakers ranges between 0.005%-0.6%.

We have analyzed about 6000 brains, but only 32 have been charted. The main thing I want to bring out is whether a man is an habitué or not, the amount of alcohol found in the brain affects all equally. You notice the numbers with stars. All those with stars are habitués. Non-habitués with 3+ are intoxicated so that when the alcoholic content of the *brain* (not the stomach), gets higher than .25%, it means intoxication; we can tell definitely, therefore, from the amount of alcohol in the brain whether a man is intoxicated or not.

To what, then, is tolerance due to? Many have worked upon this problem. Rosenfield said it was due to more rapid oxidation. It takes habitués only two-thirds the time to oxidize the alcohol that it does normals.

He found that in non-habitués the alcohol lasts longer in the system. Alcohol tolerance is nothing more than oxidizing power. Habitués have power to oxidize alcohol very quickly. One man can take a certain amount of drink and is intoxicated and another man can take the same amount of alcohol and not be drunk. Most investigators find that there is absolutely no evidence that there is any acquired resistance of cells to alcohol; it is all in oxidizing power.

The experimental work of these men and our practical experimental work on a great many cases in which we charted the history of physical condition of the person before death as well as we could get it (of course, you appreciate as well as I do some histories cannot be relied upon; we took that into consideration); we have autopsied thousands and have had over 6000 cases from which to choose, and tolerance is shown to be governed by the power of oxidation.

One question that the judges and lawyers ask me is the following: "Don't you know that one man can take a certain amount of drink and not become intoxicated while another with the same amount of alcohol will be?" I simply say that the thing to bear in mind is this: we are not analyzing to determine what the two men drank. We are not analyzing or determining what these two men have in their stomachs. It is true that they took the same amount or took different amounts. They may have the same or different amounts in the stomach; all we are interested in is how much is there in the brain. If there is an amount 0.25% in the brain, the man becomes unbalanced whether he is an habitué or not.

Supposing we take an habitué and a non-habitué and give each man the same amount of whiskey. They both absorb it. One becomes intoxicated, the other does not. The habitué does not get intoxicated, the other man does. Now why? The same amount gets into the stomach. The habitué oxidizes it faster. The normal man mainly oxidizes it in the liver.

The habitué has obtained the power of oxidation, not only in the liver, but in the lung, heart and the muscles. He has obtained that power of oxidation so he oxidizes a lot of alcohol and the amount of alcohol which gets to the brain is less. The habitué may only have 2+ or 1+ where the non-habitué may have a 3+ or 4+ from the same amount of alcohol.

Discussion

Dr. Jennings: I was extremely interested in this talk which has been given us, especially as I had to give attention in Worcester, not so long ago, to a rather interesting example, pointed out by the speaker, of the choice of method for this analysis. It was the spinal fluid which had been drawn to be examined for alcohol and the method used was the iodoform method for determining it and the iodoform reaction was obtained in quite large amounts. But when it came to our laboratory and we investigated a little more closely, we found it contained acetone; therefore the diagnosis of alcohol was totally wrong because iodoform gives a stronger reaction. I think the method that the speaker mentioned would be preferable to the iodoform reaction in that case.

Dr. Boos: We know that acetone is formed in a great many conditions in normal life and under abnormal conditions. Every patient after ether has acetone in the urine.

Question: I should like to ask the speaker a question. He has contrasted the oxidation effect of a normal individual with that of an "habitué". There are differences in normal individuals; why does one become more rapidly intoxicated than another?

Dr. Gettler: Same answer. Two non-habitués have different susceptibilities. If one of the individuals oxidizes rapidly, he will not be affected as much by that drink, but at the same time he will not have as high an alcoholic content as the other. The man who has ability to oxidize the alcohol is nevertheless affected just as much by the alcohol if it reaches the brain.

Dr. Jennings: With the same amount of alcohol in the brain, two totally different individuals would be intoxicated to the same extent.

Dr. Brickley: I would like to ask Dr. Gettler about determining the amount of alcohol in a man whose body has been examined at the time some act was committed which is under investigation, in other words, would there be continued elimination from the brain from the time he took the alcohol to the time of examination?

Dr. Gettler: Do I understand you to mean if a man is in some accident and lives 3 or 4 hours before he dies? In our chart we have different cases lasting a different number of hours. We simply can say this, that if a man lives three hours and he shows 3+ if he were to die three hours sooner, he would have had a little more. If for 3 hours between the accident and death he shows between a 2+ and 3+, you can say, if he died 3 hours sooner, he might have had a 3+ or even 4+. We find that in cases of intoxication the alcohol will remain in the brain even as long as 20-22 hours, but of course, if you analyze it after 22 hours of living, most of it was destroyed by oxidation. After 20 hours we still get traces of alcohol. For living people we have not our method completed yet.

Dr. Magrath: What criteria of intoxication are employed in hospitals, . . . used for determining whether a person was intoxicated clinically?

Dr. Gettler: At Bellevue Hospital they are doing nothing in that line as yet. I told the meeting earlier of the method of blowing through bichromate and getting a color, but we are working on the question through the spinal fluid. We are now analyzing the spinal fluid of brain and blood of cadavers.

Dr. Magrath: What are the evidences taken of those of intoxications, physical evidences?

Dr. Gettler: We are not taking any on the border line.

Question: For how long is this test accurate, assuming a person is found dead and having been dead 2 or 3 days?

Dr. Gettler: The question is asked whether the alcohol in this case can be determined if the person is dead 3 or 4 days. If the person is dead 3 or 4 days and kept cold, the test is all right, but if the body putrefies, part of the alcohol seems to go and instead of that we get pseudo reactions. So in putrefied cases we have to be very careful, but if kept cold you can do an analysis a week after.

Question: If the body had been embalmed with formalin would that prevent?

Dr. Gettler: An embalmed body *cannot* be done.

Question: I would like to ask what per cent. of alcohol in the brain is supposed to cause death? How much do you have to find to say that man died of alcoholism?

Dr. Gettler: My opinion of alcoholic deaths is that it is a chronic thing. I think the cause of alcoholic death is the continual effect, irritating, or otherwise, upon the various organs. There is no definite amount of alcohol that one can say is a fatal dose.

Question: Do you mean to say by that there are no cases of acute alcohol deaths?

DR. GETTLER: There are cases on record where a man took a great deal of alcohol and died, but you cannot say that is an overdose.

QUESTION FROM THE FLOOR: I wonder if the reaction of the individual does not play a very important part, the amount to which the circulation is depleted. The heart is tremendously dilated and the blood pressure falls, and a great many things enter into the matter. I do not think that the amount in the brain may have any special bearing on the fatal accident of the alcohol.

DR. HUNT: Just a word about what does not exactly bear on this problem. It seems to me that a tremendous amount of injustice is being perpetrated on this matter of alcoholism. An instance in my home town recently makes me think of this. A perfectly good citizen, a high class man, who had been out calling on some friends and had one or two friendly cocktails, happened to encounter a group of police officers and not suspecting them as being on special duty as they scattered in different directions, he went through the middle of them. They held him up and smelled a little something on his breath and so held him for driving while under the influence of liquor and he paid a heavy fine. He admitted he had one or two drinks, but to say he was under the influence of liquor was probably very wrong; that charge is one a police officer can bring against anybody; there have been a number of instances of police officers who themselves showed perhaps as much evidence of having an abnormal mental state as the one they arrested, yet their statement that this man was driving under the influence of liquor reacted very unfavorably to that man's friends and people in his home town.

I think it is being abused and I think we ought to use our influence to put the brakes on some of this very free use of that charge of "driving under the influence of liquor". Of course, there are many other medicolegal cases in which the liquor figures and I think it is a very splendid thing we have had some standard given to us and some method whereby we can have a rational basis of discussion in testifying where these allegations are made.

I, personally, feel very greatly indebted to Dr. Gettler for coming and telling us about this.

THE WORLD'S PHYSICIAN

(Continued from Page 722)

a Gorgas Medallion, the State winners checks for $20 and the National winner of first prize received $500 and travel allowance of $250 to come to Washington to receive the prize. The second national prize winner was given a cash prize of $150. These prizes were given by Mr. Charles R. Walgreen of Chicago. President Hoover, Honorary President of the Gorgas Memorial Institute, presented the national award at the executive offices in the presence of a distinguished company of guests.

The research work of the Memorial has been given an added impetus through the gift by the Government of Panama of a beautiful edifice which houses the laboratory in Panama. The 70th Congress of the United States made an annual appropriation of $50,000 for the maintenance of this laboratory and Latin-American countries will contribute a pro rata share on the basis of population to the support of this project. Dr. Herbert C. Clark, noted scientist, formerly of the United Fruit Company, assumed his duties as Director of the laboratory on January 1st. A Consulting Board from each Latin-American country co-operating will be appointed by the respective governments to aid Dr. Clark in his work. The Gorgas Memorial Laboratory will point the way toward better personal health from the place where the one whom it honors performed a miracle of science by making practical application of the Walter Reed theory of the transmission of yellow fever. The nations represented in the enterprise are banded together as brothers to make war on the scourges of disease. While they do not always see eye to eye on questions of international politics, in the name of Gorgas they are in this undertaking as an agency of welfare, and therefore an agency of greater efficiency and happiness for the human race.

President Hoover is the Honorary President of the Institute and Vice-President Charles Curtis is a member of its Board. At the last annual meeting held in Boston, Rear Admiral Cary T. Grayson, "Physician to Presidents," was elected the active President of the Institute and Dr. Franklin Martin, President of the American College of Surgeons, was elected Chairman of the Board. Dr. Bowman C. Crowell of Chicago was appointed Chairman of the Scientific Board which will direct the policies of the Laboratory. Outstanding physicians, dentists, scientists and statesmen comprise the board, and an Advisory Council is composed of members of the Diplomatic Corps of the various Latin-American countries.

The great work of this organization will be carried on with renewed effort during the coming year. It is the duty and privilege of the medical and dental professions to co-operate, not only because of the ultimate benefit to these professions themselves, but because of the crying need of a campaign of this sort for the Better Personal Health of our people everywhere.

In this way can the deeds of a great man live after him, his most fitting monument.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 15411

DYSPNEA AND EDEMA

MEDICAL DEPARTMENT

A Swedish-American bookkeeper thirty-five years old entered January 12 complaining of dyspnea and edema of the legs. Although he seemed mentally hazy and somewhat drowsy the history was believed to be in the main reliable.

Three years before admission he was refused life insurance. In the spring or early summer before admission his wife told him his legs looked large. He had no symptoms of any kind, however, and was in good health so far as he knew until the August before admission. Then his legs began to be swollen in the evenings, normal by morning. At the same time he began to be "short-winded" on moderate exertion. This he thought was a mild long attack of the asthma which he had had since boyhood. A physician advised him to rest. He felt so well, however, that he did not do this, but continued his ordinary activities. The dyspnea and edema grew slowly worse. With the dyspnea he had occasional palpitation. Over Labor Day he rested in a chair for three days and afterwards limited his activities. The swelling of his ankles entirely disappeared for nearly a month, but he continued to be constantly more short of breath on less exertion. Throughout September his abdomen seemed to be large. October 1 after lifting barrels he was very dyspneic and weak and had marked edema of the legs, not present in the morning. Two weeks later he took a motor trip for three days, driving himself, with one day of rest. After this he was so exhausted that he had to stay in bed for several days. He went to another doctor in November because the edema and dyspnea were worse. He was sent to bed for two weeks and a half. The edema became less, but never completely left him, although he felt much stronger. He then went back to work, his symptoms getting worse again. Early in December after doing some heavy work with his left arm he had pitting edema of the arm and hand. He was now so dyspneic, weak and edematous that he gave up his work and stayed in bed until noon. The rest of the day he did light work about the house. He was very weak, and any exertion brought back severe edema. Since December 1 his abdomen had grown steadily larger and he had become weaker. A fourth doctor made a new diagnosis. For a month before admission the patient had had marked increase in blurring of vision, which he had had more or less for a year. His memory became poorer and he found it difficult to think. A week before admission he had moderate nosebleed. During the past week his doctor had given him new medicines. During this time the patient had not been able to get enough water. For the past month he had had dull aching of the "small of the back". The morning before admission he was so weak that on trying to get up he fell back in bed and could not rise for several minutes.

His father died of "stone-cutter's consumption". A brother had had recurrent rheumatism in the past three years. The patient's wife had had one miscarriage at three months. Three children were living and well.

At ten years he was ill all winter but not in bed with typhoid fever. At twelve he had scarlet fever. He injured his head by striking a lamp-post when coasting and was unconscious for a day, with no after effects. He had very rare mild sore throats. Six years before admission he raised about ten drams of pure blood during a bad cough. For several years he had had a blood tinged stool about once a year, due he thought to intermittent hemorrhoids.

Clinical examination showed a well nourished man with cyanosis of the lips and ears, propped up in bed, slightly dyspneic. The face was puffy; no pitting edema. The skin showed generalized slight cyanosis. Over the back were some seborrheic keratoses. Chest barrel shaped. Râles at bases of both lungs. Location of the apex impulse of the heart not recorded. Left border of dullness 11.5 centimeters to the left of midsternum, 3 centimeters outside the midclavicular line, right border 3.5 centimeters, supracardiac dullness 6. Rhythm regular. Sounds of fair quality. A coarse systolic murmur at the apex. Aortic diastolic heard at the aortic area and transmitted to the left border. Aortic second sound greater than pulmonic second. Mitral first sound accentuated. No definite mitral murmur could be made out. Blood pressure 124/108 to 110/77. An electrocardiogram showed normal rhythm, rate 100, low voltage (QRS not more than 5 millimeters in any of the leads) right axis deviation, prominent P_1 and P_2, slightly notched P_1, flat T waves in all leads. Abdomen markedly distended, too tense for palpation, with dullness and fluid wave in the flanks. Umbilicus reddened and prominent. Marked edema of the legs extending up the sacrum and slightly up over the abdominal wall to the xiphoid. Edema of the genitals. Slight edema of the forearms.

Urine: 28 to 74 ounces, specific gravity 1.028 to 1.012, a trace to the slightest possible trace of albumin at two of five examinations, occasional leukocytes at one of five sediment exam-

inations, occasional red cells once, sediment loaded with hyaline and granular casts twice, casts present at two others. Blood: 11,600 to 15,600 leukocytes, 82 per cent polymorphonuclears, hemoglobin 80 per cent, reds 5,000,000. Smear normal. Wassermann negative. Icteric index 8. Stools, guaiac positive once, questionable once in five examinations.

Temperature 97.4° to 102.4°; alternate periods of elevation and nearly normal temperature. Pulse 74 to 102. Respirations 21 to 40.

January 12 an abdominal tap was done and 6,600 cubic centimeters of cloudy amber fluid removed. More was present but was prevented from flowing out by a loop of intestine. The fluid showed a specific gravity of 1.014, cell count without acetic acid 11,200, with acetic acid 3,840, 50 per cent lymphocytes, 50 per cent polymorphonuclears. Culture, no growth. After the tap the patient felt considerable relief. Examination of the heart now showed the sounds loud, the mitral first sound and the pulmonic second sound both markedly accentuated. There was a to-and-fro murmur at the apex transmitted across the lower border. The diastolic murmur had a presystolic accentuation. Along the left border was a murmur filling diastole. The aortic second sound was present.

January 14 a seven-foot X-ray plate showed the heart shadow very much increased in all diameters. The greatest increase however was to the left. The outline of the various chambers was indistinct. Respiratory excursion was limited. The heart however moved in a normal manner. The supracardiac shadow was increased. The shape of the heart shadow was not characteristic of fluid. The appearance was more that of an enlarged dilated heart. The lung fields were less radiant than normal at the bases.

During the next few days the patient gained weight. January 17 another paracentesis gave 4,300 cubic centimeters of similar fluid. Culture showed a slight growth of diphtheroids.

The patient was very drowsy and restless, with marked cyanosis of the entire body, apparently increasing and decreasing. January 19 there were numerous small hemorrhagic papules over the arms. There was leakage from the wound of the second paracentesis. The edema of the legs became less marked. The chest became somewhat clearer. The abdominal fluid reaccumulated almost as fast as it was withdrawn. January 24 the left upper arm was painful, reddened, hot and tender. The tenderness was not more marked over the course of the veins. There was marked pitting edema of the forearms. The redness and edema were more marked. The patient became very drowsy and slowly lost ground. He became delirious. January 29 a surgical consultant found no local collection of pus. There were fine and medium crepitant râles extending halfway up the chest. That night after no apparent change the patient died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

The blurring of vision is a symptom out of line with the rest. We do not expect it in a straight heart case.

A Physician: Isn't that all produced by passive congestion?

Dr. Cabot: I have never seen it. We get spots before the eyes and a little dizziness but no blurring of vision from passive congestion.

We can speculate as to what his physician gave him that made him want to drink water. I don't know.

Stonecutter's consumption is not hereditary. It usually starts as scars from the irritating particles; tuberculosis often supervenes later.

Unless the rheumatism of his brother shows a family tendency—and certainly rheumatism is a family disease—we have nothing to help us in the family history.

Do you believe he had typhoid for that length of time? I do not. Walking typhoid does not walk all winter. I do not know what he had, but it was not typhoid.

The scarlet fever may be very important in this case.

What do you conclude from the hemoptysis? It may have been due to mitral disease with infarction of the lungs. Tuberculosis may show hemoptysis and nothing more except a scar post mortem. We have no reason, I believe, to connect the blood with cirrhosis of the liver, which is another possible cause, especially as it came up during a bad cough rather than from the stomach.

I do not see any reason to doubt his judgment in thinking that he had intermittent hemorrhoids.

NOTES ON THE PHYSICAL EXAMINATION

It is rather strange that there was no pitting edema. I certainly should have expected it.

The râles are presumably due to passive congestion.

The percussion measurements show enlargement of the heart if they are true. Believing what I believe about the case I think they are true. I should have believed the heart was enlarged just the same if they had not percussed at all.

Of course with that aortic murmur we expect a high pulse pressure. We find however a very small one at first and later no increase over normal.

The electrocardiogram shows no evidence of a gross myocardial lesion. Prominent P_1 and P_2 go sometimes with mitral stenosis. They are

not characteristic of any one disease. I do not believe anyone could draw any clear conclusions from that electrocardiogram. I certainly cannot.

We estimate the amount of urine in ounces because it is convenient to plot it on the respiratory part of the chart. The ordinary chart shows temperature, pulse and respiration; so by using a different colored ink we can easily plot the urine in ounces (rather than in cubic centimeters) on the respiration chart.

The important thing about the urine is that there were three examinations with no albumin at all. Summing that urine report all up, I should say we have no evidence of nephritis. That is important, because certain things in the history made us think of nephritis.

A PHYSICIAN: Do you need to have hyalin and granular casts five times?

DR. CABOT: Yes, and other kinds also. Those are the less important, harmless types of casts. We do not know whether the casts are more numerous in this case than in health or whether they happened to have the good luck to get them.

The blood is essentially normal. There is a slight suggestion of leukocytosis.

The icteric index is within the limits of high normal.

The chart shows periods of three or four days when the temperature was above 100°. The pulse was steady. We certainly cannot explain all that temperature on the basis of passive congestion. There ought to be something else.

Cell counts of abdominal fluid are usually a waste of time in my opinion. In spinal fluid they are very important, in chest fluid sometimes important. Very rarely have cell counts of abdominal fluids helped any diagnosis that I can remember. It is just routine, and better honored in the breach than the observance.

Of course the accentuated mitral first sound means a sharp first sound, and makes us suspect that we should have heard a middiastolic or presystolic murmur. There is certainly also a see-saw murmur as in aortic regurgitation.

The report of the heart examination means that the man who wrote it is now thinking there is mitral stenosis as well as aortic regurgitation.

DR. GEORGE W. HOLMES: This plate was taken at seven-foot distance and there was also a fluoroscopic study made. With a heart as much enlarged as this is the lungs are more or less congested and it is very difficult to get a satisfactory oblique study. The object of the oblique view is to determine the projection of the auricle into the space back of the heart and to determine the size of the aorta. In this case the examination was distinctly unsatisfactory. The heart shadow was definitely increased in size and the increase was rather general. The figures were 7.4 centimeters to the right and 12.8 centimeters to the left of the midline, making a total of about 20 centimeters. His chest was 32 centimeters. According to that he should normally have a heart about 16 centimeters transverse diameter at the maximum. That is by far the most reliable measurement. The other measurements are to help you form some idea of the shape of the heart when you read the record. The heart is enlarged in all diameters, but the greatest increase is in the region of the left ventricle. An increased supracardiac shadow with a dilated heart such as this is does not necessarily mean dilatation of the aorta. If it is 6 centimeters or under we rarely find dilatation of the aorta. We are told the outline of the various chambers was indistinct. Ordinarily we can make them out very well. When they are indistinct we suspect that the heart is either so weak or so dilated that the characteristic pulsations are not brought out, or that there is fluid in the pericardium.

"Respiratory movements of the heart were limited." This probably means that the respiratory movements of the diaphragm were also limited. The movements of the heart are limited in cases of pericardial adhesions.

"The appearance is that of an enlarged and dilated heart." I should have to agree with that. The dullness along the borders of the lung is probably due to passive congestion. The presence or absence of fluid of course cannot be entirely ruled out. There can be 500 cubic centimeters of fluid in the pericardium without any visible evidence by X-ray.

DR. CABOT: Is the pericardium adherent?

DR. HOLMES: No signs of it.

DR. CABOT: Dr. Holmes and I have questioned for years as to whether X-ray can help us find out whether the pericardium is adherent. We apparently have no evidence of acute pericarditis with effusion, one of the things I have been considering as a cause for leukocytosis and blurred vision.

We are not justified in making a diagnosis that includes only passive congestion.

The culture shows contamination. Am I right?

DR. TRACY B. MALLORY: Probably.

DR. CABOT: That rash is the most interesting fact we have had up to date. We see these little red spots which are signs of embolism in all probability. We have a second evidence of embolism when the redness became more marked.

The râles have no significance that I know of.

A PHYSICIAN: Could you explain his vision also on the basis of the old illness miscalled typhoid?

DR. CABOT: Possibly. But he had typhoid when he was ten years old, twenty-five years ago. I do not think his history of typhoid at ten was the beginning of subacute bacterial endocarditis, and if this does suggest bacterial endocarditis, it will not account for such a big heart as that.

DIFFERENTIAL DIAGNOSIS

Chronic bacterial endocarditis on his aortic valve with aortic stenosis and regurgitation, pre-

venting the Corrigan pulse which otherwise we should get. On top of those was engrafted the acute process which I think we have a right to assume, bacterial endocarditis.

A Physician: How would you sign the death report? Chronic endocarditis with mitral stenosis?

Dr. Cabot: Subacute bacterial endocarditis as the immediate, later cause of death; but chronic endocarditis, aortic and mitral stenosis, as main cause. They usually give space for two. He certainly has passive congestion also. I do not think there is evidence of any disease of the kidney unless infarcts coming from the same source on the valves. The negative Wassermann makes me think that this was the rheumatic type rather than the syphilitic type of heart disease.

I do not know why he did not have anemia. He probably had not had the disease for a long enough time to produce anemia.

A Physician: How do you explain the coughing of blood?

Dr. Cabot: There was an old mitral lesion there, hence infarcts and hemoptysis. I believe this has been going on for some years, this subacute bacterial endocarditis that I am assuming he has. I suppose so. There is no blood culture.

A Physician: How far back do you suppose this dates?

Dr. Cabot: The chronic rheumatic lesion dates back to some time before he was twenty, perhaps also the bacterial endocarditis. I never heard of any such case well substantiated. If we had got a positive blood culture at the age of ten, then the present picture fifteen years afterward, that is the kind of evidence I want.

A Physician: Does the red count show cyanosis?

Dr. Cabot: Perhaps he really had no more than 3,000,000 reds, but was so cyanosed that it brought the count up to 5,000,000. If so, he had this additional evidence of anemia.

Let us sum up. I assume that the heart is the important thing. I think the heart ought to weigh 700 grams, there or thereabouts. It ought to be hypertrophied and dilated, with a lesion of the aortic valve with stenosis and regurgitation, perhaps also a lesion at the mitral, though there is not good evidence of it. We might as well have a lesion at the tricuspid also. Dr. Holmes has assured us that no adherent pericardium will be found.

Dr. Holmes: There is not much evidence of it.

Dr. Cabot: We cannot say adherent pericardium. On top of this old process there should be subacute bacterial endocarditis, the organism being the green-producing streptococcus. The rest of the body ought to show passive congestion plus infection, that in the arm being the most definite.

A Physician: Could you explain the hemoptysis also on the basis of infarct in the lungs?

Dr. Cabot: That was a good while ago. I would rather explain it as possible congestion and the breaking of blood vessels from that.

A Physician: How do you explain the blurring of vision?

Dr. Cabot: I am not explaining that. But as I said, it might be due to embolism of the central artery of the retina, which we have known to occur in subacute bacterial endocarditis along with spots of phlebitis. It might be a third evidence of embolism.

A Physician: Why shouldn't you accept it as a kidney lesion? The urine was loaded with hyalin and granular casts.

Dr. Cabot: Because there is not enough evidence. I should want a greater variety of casts, more blood, more limitation in the fluctuation of the gravity. In hyposthenuria the gravity will not go up; it stays down. There should be evidence of retained products which should have been put out by the kidney and were in the blood. But this is a perfectly good history of kidney disease, and one high diastolic blood pressure would support it.

A Physician: How about myocarditis?

Dr. Cabot: I vote against it. I see no evidence for it.

A Physician: Could it be pericardial effusion and terminal pneumonia?

Dr. Cabot: That is a possibility.

Interpretation of X-ray

The changes in the lungs may be of cardiac origin.

Clinical diagnoses (from hospital record)

Rheumatic heart disease with mitral stenosis.
Aortic regurgitation.

Dr. Richard C. Cabot's diagnoses

Chronic rheumatic heart disease, aortic, mitral (and possibly tricuspid), with stenosis and regurgitation.
Subacute bacterial endocarditis.
Hypertrophy and dilatation of the heart.

Anatomic diagnoses

1. *Primary disease.*

Rheumatic endocarditis.
Mitral and aortic stenosis.
Rheumatic pericarditis with effusion.

2. *Secondary or terminal lesions.*

Chronic passive congestion.
Cirrhosis of the liver, cardiac type.
Infarct of the kidney.
Thrombosis of the left subclavian vein.
Cellulitis of the left arm.
Streptococcus hemolyticus septicemia.

DR. MALLORY: This man had an old rheumatic heart with much hypertrophy,—weight 600 grams,—with stenosis of both mitral and aortic valves and probably some degree of regurgitation in the aortic valve. He had a fairly considerable amount of fluid in the pericardium, 490 cubic centimeters, which is about the limit Dr. Holmes mentioned as not being visible by X-ray. There is no question but there was a terminal pericarditis, not merely a serous effusion.

His terminal infection was not a subacute bacterial endocarditis, but was a thrombosis of the left subclavian vein of a septic type with hemolytic streptococci in it. From that some septic extension into the surrounding tissues had occurred. No emboli had broken off; there were no infarcts in the lung. I think the skin lesions observed may have been hemorrhagic patches due to something other than emboli. Emboli would have had to pass through the lung to get into the general circulation. He had an old thrombus which was not septic in type in the heart, and from that non-septic emboli in the general circulation had arisen.

DR. CABOT: There was no nephritis?

DR. MALLORY: No, none.

A PHYSICIAN: Did he have an infarct of the kidney?

DR. MALLORY: Yes; owing to the mitral lesion there was a clot in the left auricle. It had nothing to do with the streptococcus infection. It is a common finding in a large percentage of mitral cases.

A PHYSICIAN: How did the infarct get to the kidney?

DR. MALLORY: From behind the stenosed mitral valve. Owing to the slowing of the circulation and probably to roughening of the auricular wall, a clot occurs there, a portion of which may break off into the general circulation and enter the kidney.

A PHYSICIAN: What was the focus of infection?

DR. MALLORY: It was this phlebitis in the left subclavian vein.

CASE 15412

ANEMIA; CAUSE?

SURGICAL DEPARTMENT

A married Swedish woman forty-five years old was referred to the Medical Out-Patient Department June 20 by her physician. He wrote that she had had blood examination and treatment for some months with liver extract and injections of iron citrate, and asked for a diagnosis of the blood condition and an outline of treatment. Examination in the Out-Patient Department showed a lemon-yellow pallor, hemoglobin 35 per cent, 2,970,000 red blood cells. A tentative diagnosis of possible primary, possible secondary anemia was made. She was referred to the wards for study.

First admission. June 22 she entered the Medical wards. Her chief complaints were weakness and fatigability of two years' duration. Her appetite had always been poor and capricious. For years she had had periods of vague epigastric discomfort with occasional heartburn and attacks of diarrhea. For two years she had been eating yeast cakes, at least three a day, with much relief of her symptoms. For the same period she had grown increasingly weak and fatigable. During the winter she had edema of the ankles, worst in midwinter but still persisting. She had not had dyspnea or palpitation. She had grown very pale and sallow. For a year she had been under medical care, and had taken much medicine. Six months before admission she had a severe generalized pruritus lasting three months. Four months before admission she had herpes zoster involving the left arm. At this time she stopped taking yeast and by advice of her physician took liver extract and intramuscular injections of iron citrate. She had gradually reduced the liver extract. During the past few months the pallor, weakness and anorexia had increased until at last she came to this hospital. She had lost fifteen pounds in the past year.

She had had one miscarriage at two months. Her past history also includes tonsillitis and influenza. For a year she had urinated once or twice at night. Her menstruation had been painful until recently. She had lived in this vicinity for twenty-five years. She was fond of anchovies and preserved fish.

Clinical examination showed a well nourished, pale, sallow woman, very nervous and tense. Abdomen level. At the entrance examination it showed very intense voluntary spasm which made it impossible to feel anything. The next day a slightly tender mass was felt on the right side just above the level of the umbilicus, descending with inspiration. At this time the tongue was thought to be suggestive. Vaginal examination showed a pessary; nothing remarkable was made out. The rest of the examination was negative.

Urine not remarkable. Blood: hemoglobin 40 per cent, reds 2,850,000, marked anisocytosis and polychromatophilia, slight poikilocytosis, some enormous reds, not heavily stained, occasional nucleated reds; 17,500 leukocytes, 82 per cent polymorphonuclears, platelets and leukocytes normal in the smear. Non-protein nitrogen and icteric index normal. Hinton negative. Stools: guaiac strongly positive. Fasting contents of stomach: 5 cubic centimeters of foul brown material, no free HCl, total acid 10 cubic centimeters, guaiac, a trace. Test meal at one hour: 30 cubic centimeters, foul, brown, no HCl, total acid 90 cubic centimeters, guaiac, a trace.

X-ray examination showed the stomach low, rather dilated. There was complete six-hour retention of the motor meal. During the examina-

tion no barium could be forced through the pylorus. The pyloric end of the stomach presented an irregular constriction suggestive of carcinoma, although it was not entirely characteristic. At eighteen hours the stomach was markedly distended and showed about 80 per cent retention of the barium. The deformity at the pyloric end was unchanged. The findings at this examination suggested ulcer rather than carcinoma, although the latter could not be ruled out.

Before operation temperature 98.4° to 100.2°, pulse 80 to 120, respirations 18 to 28.

A surgical consultant advised operation. June 26 it was done, after transfusion of 750 cubic centimeters of blood. The patient made a good convalescence. July 15 another transfusion was done and 600 cubic centimeters of blood given. July 17 she was discharged, to return for a second operation.

History of interval. During the next week and a half she felt fairly well. Two or three times she vomited small amounts of greenish bitter fluid. She passed tarry stools. In general she felt better and stronger at her readmission.

Second admission, July 29.

At examination several conditions were much better than at the previous entry. The wound was well healed. She was still very pale.

July 31 a second operation was done. There was a moderate rise in temperature, pulse and respirations after it. A week later a wound abscess was opened and drained. Further complications of the convalescence were cervical adenitis and phlebitis of the right arm. August 22 the patient was discharged.

Discussion

BY EDWARD L. YOUNG, JR., M.D.

Whenever a patient reports for diagnosis with anemia as the presenting symptom, even though it is as marked as it was with this patient, malignant disease should always be considered. It is not uncommon to have a patient show the typical signs of primary anemia without any symptoms referable to cancer and later in the disease to have some type of malignancy come to the surface. The symptoms that this patient had are all symptoms directly due to the anemia or such as might go with it.

I think it is worth while to call attention to the marked relief of her symptoms from yeast cakes. This can be taken in two ways, depending on your therapeutic viewpoint. On the one hand they could not have done any actual good. On the other hand they would relieve symptoms; and it may be said with some logic that if they relieved symptoms they were of value whether they relieved any organic condition or not and whether the relief was due to the physical or the mental effect. Assuming that relief does not mask important symptoms or delay the recognition of the real condition, it is an argument which may be allowed.

At the time she reached the hospital, examination gives a clue to a diagnosis other than primary anemia. The mass in the abdomen points at once towards malignant disease in the intestinal tract. Examination of the stomach contents bears this out and X-ray clinches the diagnosis; that is, it brings it down to one of two things, either cancer or an old ulcer. The complete lack of symptoms, the absence of free hydrochloric acid in the stomach, the size of the growth all make ulcer a very improbable diagnosis.

The question now comes, can anything be done to help? We know that cancer of the stomach, especially when its early symptoms have been masked as long as this, stands a small chance of being cured. Nevertheless something ought to be done to improve her condition if possible. She obviously could not stand an operation of any great extent. She has lost a great deal of weight, strength, and blood, and has no body reserve to carry her through. Nevertheless it seemed worth while to try. Plans were made to do what it seems to me should be done more often in this type of case, namely a two-stage operation to give the stomach drainage, to give the patient a chance to absorb food and fluid, to lessen the local edema and to make the actual removal of the growth easier if at the first operation it seems at all possible.

The question of the relation of transfusion and operation in these cases is important. It has been shown at the Mayo Clinic that the best time for operation is immediately following transfusion. Accordingly this was planned.

Pre-operative diagnosis June 27

Carcinoma of the stomach.

First operation

After transfusion the abdomen was opened and a large mass at least ten centimeters in greatest diameter was found occupying the pyloric end of the stomach. It was adherent to the pancreas beneath and the gall bladder above, but the liver was not involved and the few glands in the gastrohepatic omentum were not hard like malignant metastasis. A posterior gastro-enterostomy was done far enough away from the growth so that a secondary resection could be done in case the patient came through the first operation satisfactorily.

Further Discussion

Examination of the growth showed that it was almost certainly removable, and the drainage was done far enough away from the growth to allow the secondary resection.

The patient stood the operation remarkably well and picked up rapidly afterward, gaining strength and weight. She went home for a

while and returned in excellent condition for the second operation.

SECOND OPERATION

The abdomen was found to contain almost no adhesions after the first operation. The gastro-enterostomy was placed well to the left in the posterior wall of the stomach. The growth formed a large mass which involved the antrum. There were metastatic glands in the gastrocolic mesentery, and the growth was adherent to the colon and the pancreas, but apparently had not actually invaded these organs. No nodules were felt in the liver. The mesentery of the colon containing the median colic artery could be freed from the growth, which was then evidently removable but not curable. The lower half of the stomach was resected and continuity established by the Billroth II method, using Pagenstecher catgut as at the first stage of the operation.

PATHOLOGIC REPORT

A segment of stomach ten centimeters in length. On the posterior surface there is a dense raised irregular nodular area about 5 centimeters in diameter covered by peritoneum. On the greater curvature the omentum is bound down tightly to the wall and contains many firm adherent glands. On the mucosal surface there is a completely encircling growth 9 centimeters in diameter with raised polypoid cauliflower-like edges and a central ulcerated necrotic area 5 centimeters in diameter. There is about one centimeter of grossly normal mucosa at either end of the tumor.

Microscopic examination shows the structure of a well defined adenocarcinoma. There is but slight tendency to form gland-like structures, and the invasive character with mitotic figures shows it to be a fairly rapidly growing tumor.

Adenocarcinoma of the stomach.

FURTHER DISCUSSION

At this time the edema had gone down and it was much easier to resect the growth than it would have been the first time. Moreover, the patient had established the tolerance for the gastro-enterostomy and the question of feeding after operation was not a problem.

At the present time the patient has gained rapidly and is perfectly comfortable. Although the procedure has probably not cured, it has justified itself in the relief of symptoms and the prolongation of life. The two-stage operation is one that should be used more often than it is at present.

LATER NOTE

The patient made a visit to the Out-Patient Department on September 3. The record notes, "Excellent operation." She had some pain, but was sleeping well, and her bowels moved normally without medication. She had no nausea or feeling of fullness. Fatigue was her only symptom. She had been up and about for two weeks. Her tongue had been sore, but was not so now. She was taking a pretty liberal diet. She was still pale.

DIAGNOSIS

Adenocarcinoma of the stomach.
Abscess of abdominal wall.
Cervical adenitis.
Phlebitis of arm.

ERRATUM

In Case 15392, published September 26, 1929, the following misprint occurs in Dr. Reggio's discussion on page 645: "It was *not* felt that the first diagnosis was wrong, and a tentative diagnosis of either extra-uterine pregnancy or ovarian cyst was made." The sentence should read: "It was *now* felt" etc.

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UNDULANT FEVER

THE increased respect which undulant fever has demanded and won from the medical profession in the last two years seems to be well justified. As evidence of the importance which it is assuming, we may recall that it was the subject of one of the papers read before the Pediatric Section of the Massachusetts Medical Society in June of this year, and soon to be published in this JOURNAL, and that two papers on it were presented before the Section on Practice of Medicine at the annual session of the American Medical Association in July. These papers by A. V. Hardy of Iowa City, and W. L. Bierring of Des Moines, Iowa, appeared in the *Journal of the American Medical Association* for September 21, and are well worthy of attention.

Hardy, dealing with the etiology, epidemiology and laboratory diagnosis of the disease, points out that during 1924 and 1925 in the United States, exclusive of Texas, Arizona and New Mexico, ten cases were recognized in six widely separated states. During 1928 and the first five months of 1929, more than a thousand cases were recognized, having their origin in forty-two states.

A correct understanding of the bacteriology of the disease has been of slow development. Colonel Bruce in 1886 first observed minute organisms in the spleen of a patient dying of undulant fever. The following year he cultivated and described small coccoid bodies to which he gave the name *Micrococcus melitensis*. It was later noted that bacillary as well as coccoid forms occurred. In 1897 Bang isolated a small bacillus as the etiologic agent of contagious abortion of cattle, and the name *Bacillus abortus* was soon accepted. It was not until 1918 that Miss Alice Evans pointed out that these organisms were "morphologically, culturally and biochemically indistinguishable, and serologically very closely related". In 1920 Meyer recommended the formation of a new genus for these and related species, giving to them the name *Brucella*. *Micrococcus melitensis* then became *Brucella melitensis* variety *melitensis*, and *Bacillus abortus* became *Brucella melitensis* variety *abortus*, which was again divided into the bovine and porcine types. The melitensis variety occurs naturally in goats and is of little importance in the United States except in the Southwest; all states have cattle infected with the abortus types. The importance of the porcine type in the spread of undulant fever is believed by many, and is indicated by Hardy's isolation from human beings of twenty-one porcine out of twenty-eight strains.

The pathology of *Brucella melitensis* infection in human beings is little known, there having been mentioned in fatal cases only enlargement of the liver, basal congestion of the lungs and occasional involvement of the intestine and lymph glands. Cases have also been reported of cardiac disease and of meningitis with local pathologic lesions. Diagnosis, without serologic evidence, is so difficult that it is fair to assume that many cases are passing unrecognized.

Sources of infection are difficult to detect, since animals with contagious abortion show no external manifestations of the disease. Using serologic examinations of cattle and hogs, Hardy found that on the basis of clinical evidence alone—abortion, retained placentas and sterility—infected herds might easily be missed.

As far as transmission is concerned, it is known that undulant fever may be transmitted through the use of raw goat's milk. The use of raw dairy products, however, cannot account for all the infections due to cattle. Many occur in individuals who had direct contact with the animals other than the drinking of milk. The incidence has been higher among farm men than among farm women, and higher among adults than among children. Another mode of transmission, moreover, must be considered where hogs are concerned. Considering these factors, and since it is known that in guinea pigs the unabraded skin is a more ready portal of entry than the digestive tract, Hardy feels justified in believing that direct entrance of the organ-

isms through the skin has not been given due consideration.

The diagnosis in man must practically always be made in the laboratory, by the microscopic agglutination test. In this, titers of less than 1:40 are regarded as negative; 1:40 as doubtful; 1:80 as weakly positive; 1,160 and 1:320 as positive, and 1:640 and 1:1,280 as strongly positive.

Bierring studied one hundred and fifty clinical cases, noting the relatively slight infection in children, the largest users of milk.

Three classes of cases are recognized:

1. A pernicious type, rare and generally fatal.
2. An undulant type, characterized by exacerbations of temperature at regular intervals.
3. A continued type, with continuous fever persisting for weeks or months.

Other clinical characteristics are the gradual and insidious onset with the development of weakness, the high fever with singular lack of discomfort, the rigors, the chills with profuse sweating, the muscular and joint pains, the loss of weight and the undulant and persistent character of the fever curve.

The urine showed no significant change and the cerebrospinal fluid was normal in the three cases in which it was examined. A leukocytosis was observed in a few cases, but a leukopenia with a relative increase of lymphocytes and mononuclear cells was the rule.

THE NEW QUARTERS FOR THE SOCIETY AND THE JOURNAL

A CHANGE of location of the offices for conducting some of the affairs of the Massachusetts Medical Society is worthy of more than passing reference. A notice of the prospective removal to 165 Newbury Street, Boston, of the executive offices of the Society and of the NEW ENGLAND JOURNAL OF MEDICINE was published in a previous issue.

The rooms which accommodated the editorial force of the JOURNAL at 126 Massachusetts Avenue were first leased by the former owners of the JOURNAL on January 1, 1915. With the transfer of the JOURNAL to the Massachusetts Medical Society in 1921 the business details which had been to a considerable extent conducted by the Jamaica Printing Company were transferred to the editorial rooms. With the growth of the Society and greater activities of committees, additional rooms were secured from time to time where the treasurer could carry on his clerical work and committees and other officers could meet. This location was central and easily reached from all directions and in many ways has been convenient. But Boston is a growing city and the congestion of the streets in that vicinity together with close proximity to the railroad brought about disturbing conditions especially acute in warm weather when the windows had to be more or less constantly open

Recognition of these handicaps led to conferences from time to time resulting in unanimity of opinion with respect to the advisability of seeking more quiet rooms. Efforts in this direction would have been more persistent but for the prospect of accommodations in the proposed extension of the Boston Medical Library building; but when it was found impossible to start immediately on the building program outlined in the drive for funds by the Library and the Massachusetts Medical Society, it was deemed best to secure suitable accommodations pending the time when rooms in the Library will be available.

For the next two years the executive office and committee room of the Society and the JOURNAL offices will be at 165 Newbury Street. It should be clearly understood that this in no way supplants or modifies the original expectation of accepting the hospitality of the Library and the Library will not feel driven to put its plans into operation before it is ready to proceed with the building.

The same arguments for concerted action by the Library and the Society still apply and it is hoped that the resumption of the campaign for the endowment will be undertaken with the same determination which was evident in the beginning.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

PALMER, ROBERT S. M.D. Harvard 1925. Assistant in Medicine, Massachusetts General Hospital and the Harvard Medical School. Address: 264 Beacon Street, Boston. Associated with him is:

SILVER, LOUIS S. M.D. Tufts College Medical School 1914. Assistant in Medicine, Massachusetts General Hospital and Beth Israel Hospital. Visiting Physician, Malden Hospital. Address: 483 Beacon Street, Boston. And

WHITE, PAUL D. A.B., M.D. Harvard 1911. Physician, Massachusetts General Hospital. Address: Massachusetts General Hospital. They write on: "The Clinical Use of Potassium Sulphocyanate in Hypertension." Page 709.

KIEFER, EVERETT D. A.B., M.D. Harvard 1926. Physician, Department of Gastro-Enterology, Lahey Clinic, Boston. His subject is: "Functional Disorders of the Colon." Page 715. Address: 605 Commonwealth Avenue, Boston.

YOUNG, EDWARD L. JR. A.B., M.D. Harvard 1909. F.A.C.S. Assistant Surgeon, Massachusetts General Hospital; Surgeon, Faulkner Hospital, New England Baptist Hospital, Robert B. Brigham Hospital; Instructor in Surgery, Harvard Medical School. His subject is: "In-

dustrial Hernia." Page 720. Address: 279 Clarendon Street, Boston, Mass.

JONES, FRED D. M.D. Tufts College Medical School 1913. Pathologist to Springfield Hospital, Springfield; Wesson Memorial Hospital, Springfield; Holyoke Hospital, Holyoke; Cooley Dickinson Hospital, Northampton and Noble Hospital, Westfield. His subject is: "Report of a Case of Admitted Manslaughter." Page 723. Address: 20 Maple Street, Springfield, Mass.

GETTLER, ALEXANDER O. Ph.D. Columbia University 1912. Professor of Chemistry at New York University (Bellevue Medical College); Toxicologist to Chief Medical Examiner's Office of New York City. Pathological Chemist, Department of Hospitals, New York City. His subject is: "Chemical Evidences of Alcoholic Intoxication and Their Medico-Legal Significance." Page 724. Address: New York University, 26th Street and First Avenue, New York.

MISCELLANY

THE COUNCIL MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY

A large number of councilors met on October 2 to greet the new President and transact the business outlined in the call sent by the Secretary.

Before proceeding with the business, Dr. Greenough made appropriate references to the loss sustained by the deaths of several members of the Council since the last meeting, giving the essential details of the lives of each.

He referred to the present status of several problems considered by the Council the past year and kept the discussion concentrated on the subjects presented so that the business was transacted promptly.

The Secretary's report of the proceedings will be published in an early issue and should be carefully read, for matters considered are of importance and every Fellow of the Society should keep informed of the doings of this representative body.

GORGAS INSTITUTE SPONSORS SECOND ESSAY CONTEST

HIGH SCHOOL STUDENTS IN JUNIOR AND SENIOR CLASSES TO PARTICIPATE IN HEALTH CONTEST

A second national essay contest on a health topic is scheduled for junior and senior students of high schools throughout the country, according to an announcement by the Gorgas Memorial Institute, 1331 G Street, N. W., Washington, D. C.

CHICAGO MAN DONOR OF PRIZES

Cash prizes for contest winners are again available through the generosity and interest of Mr. Charles R. Walgreen, Chicago, Illinois. There will be three prizes for winners of the national contest. First prize will consist of $500 in cash with $250 travel allowance to Washington, D. C., to receive the prize; second prize winner will receive $250 in cash, and the winner of third prize will receive $100 in cash. State winners will receive $20 in cash and the winners of the high school contest will receive a bronze Gorgas Medallion. The subject selected for this year's contest is "The Gorgas Memorial; Its Relation to Personal Health and the Periodic Health Examination." The contest opened September 16 and all high school papers must be received at the headquarters of the Institute by midnight, December 10. High school winners will be chosen by faculty members. The winning paper will then be sent to Washington to Institute headquarters for entrance in the State Contest, the judges of which will be the State Commissioners of Health, the State Superintendent of Schools, and the Honorable Secretary of State. The national winners will then be selected by the U. S. Commissioner of Education, the Surgeon-General of the U. S. Public Health Service, and the Director General of the American College of Surgeons.

SUCCESSFUL CONTEST LAST YEAR

The 1928-1929 contest conducted by this organization was considered a great success and was participated in by one out of every 100 high school pupils in junior and senior classes. Winners of the contest conducted in high schools received a bronze Gorgas Medallion from the Institute, while each State winner was awarded a cash prize of $20. The national award of $500 in cash and a travel allowance to Washington, D. C., was won by a girl from Mountainburg, Arkansas, Miss Gertrude Carter Stockard. The second national award, a cash prize of $150 was won by Miss Marguerite Hastings, Watertown, Massachusetts. President Hoover, Honorary President of the Institute, presented the award at the White House in the presence of a distinguished company of guests. It is planned to honor the winner of this year's contest with a similar ceremony during Easter Week.

CONTEST HONORS GENERAL GORGAS

Major-General William Crawford Gorgas, around whose life and achievements the contest centers, became famous because of his great work in Havana and Panama in connection with the elimination of Yellow Fever. It is said that his practical application of the Walter Reed theory of the transmission of yellow fever made possible the building of the Panama Canal. Later, as head of the medical corps during the World War, he established a system of strict physical examination of soldier boys as a means of getting a fit army, and followed this with a plan of medical supervision which attracted attention throughout the world. Mr. Walgreen, donor of the prizes, was himself a victim of yellow fever during the Spanish-American War.

The Institute is officered by prominent physicians, dentists and laymen, President Hoover is Honorary President; Rear Admiral Cary T. Grayson of Washington, D. C., is the active President; and Dr. Franklin Martin, Chicago, Illinois, is chairman of the board.

THE CONDITION OF BARBER SHOPS

If correctly reported in the press, Dr. George H. Bigelow, Commissioner of Health, believes that "between 35 and 40 per cent. of the barber shops in Massachusetts are unsanitary."

Some barbers are working for the adoption by the

State of a law which will provide for the regulation of barbers and inspection of the shops.

There seem to be valid reasons for the arguments advanced.

TUBERCULOSIS ABSTRACTS

For years, search has been made for some blood serum test that might indicate specifically the presence of tuberculous infection and that would vary consistently with different clinical or pathological

PAUL EHRLICH (1854-1915)
Pioneer in Serology.

stages of that infection. No reaction is yet known that satisfies both of these conditions. However, the tuberculo-complement fixation test, after several years of uncertain status, has at last been so technically perfected and standardized that it has a very distinct value. Dr. James Wynn of the Indiana University Medical School describes this and other serological tests for tuberculosis. While a detailed knowledge of serological technique is not necessary, an understanding of the principles underlying this test is essential for the clinician who would interpret it judiciously.

TUBERCULO-COMPLEMENT FIXATION

In tuberculous infection, the bacillary focus, acting antigenically through blood-stream absorption, tends to stimulate the patient's serum to the production of a thermostabile substance commonly referred to as reagin or amboceptor. This substance is highly specific for the antigen. In the presence of complement (a thermolabile substance present in any fresh blood serum, whether normal or immune), this reagin will combine with both antigen and complement. If a tuberculous suspect's serum is mixed, in the presence of complement, with an antigen specially prepared from boiled tubercle bacilli, the disappearance of complement from the mixture connotes antigen-reagin-complement union—which means that the suspected serum contained the tuberculosis reagin; *i.e.*, was positive. (This disappearance of complement is demonstrated, as in the Wassermann reaction, by mixture with a hemolytic system in which suspended erythrocytes are the antigen and serum hemolysin the reagin; if there is no hemolysis, it is clear that complement has been previously "fixed" by the tuberculosis reagin and the reaction is positive. A quantitative technique and accurate titration of antigen make it possible to embody the foregoing immunological principles in a diagnostic test. It is necessary to parallel the test with the Wassermann reaction, since a positive tuberculo-complement fixation is of little significance in the presence of a positive Wassermann reaction.

Though in its earlier years tuberculo-complement fixation appeared to be of doubtful value, when skilfully performed the test now gives, within reasonable limits, distinctly reliable information. This demonstration of the test's true worth is due almost entirely to the work of such men as Petroff and Woolley in standardizing technique, antigen, etc.

According to Woolley, "With accurate technique, the reaction is positive in 60 to 80 per cent. of cases, depending on the stage of the disease." Blood-stream absorption from the tuberculous focus is necessary to produce reagin production. And there must be sufficient absorption to stimulate an excess of reagin over the amount necessary to fix the lesion-produced antigen. (It is the failure of this excess which accounts for the low reagin curve in terminal stages of the disease.) It is apparent, therefore, that a positive reaction is of far from trivial significance and may be taken to mean activity in the sense that the focus is producing very definite systemic absorption. The fact that this absorption may be quantitatively insufficient to occasion symptoms or physical signs in a measure invalidates the test as an index to the extent of clinical activity. Nevertheless, a strongly positive and persistent reaction is very suggestive evidence of impending if not actually existent clinical activity.

On the other hand, in a patient with definite symptoms and physical signs pointing to active tuberculous disease, a negative reaction by no means excludes tuberculosis; for, as previously stated, the reaction measures merely the *excess* of blood reagin (which is occasionally nil, *e.g.*, in overwhelming or terminal infections). The real usefulness of the negative reaction is in differentiating tuberculosis from such conditions as bronchiectasis, certain forms of chronic bronchitis, and interstitial pneumonia.

CELL SEDIMENTATION TEST

Several other recently proposed serological tests for tuberculosis may be briefly mentioned. A definite relationship has long been recognized between certain physiological and pathological states and the rate at which the cells in citrated blood settle on standing. Westergren (1921) observed what he believed to be a diagnostic type of sedimentation in pulmonary tuberculosis. The test requires so little apparatus and technical skill that it can be performed by any careful physician. Of the various techniques in general use, many of the best features are incorporated in the method of Cutler (1929) which is as follows:

After drawing 0.1 c.c. of freshly prepared sterile 3% sodium-citrate solution through a 20-gauge needle into a dry, sterile 2 c.c. syringe, a vein is entered and blood drawn to the 1 c.c. mark. The syringe is then tilted gently back and forth to avoid clotting, and the mixture promptly injected into a Cutler tube. (These tubes have an internal diameter of 5 mm. and are marked in millimeters, beginning with zero at the 1 c.c. level, increasing downward to 50.) The tube is tightly stoppered until ready for reading. Its contents are then

thoroughly mixed and the level of the settling cells noted every five minutes for one hour. These data are graphed (with the time in minutes and the level in millimeters). Cutler has described fairly characteristic curves for normality, pulmonary quiescence, slight to moderate activity, and moderate to marked activity—the cell levels at 60 minutes for these groups being respectively 3, 15, 20, and 30 mm. Comparison of a patient's graphs from week to week is of distinct value in clinical management and prognosis. But the test is of little or no differential diagnostic value.

TEST FOR ANTIBODIES IN URINE

Assuming that in active tuberculosis antibodies would be eliminated in the urine, Wildbolz (1919) suggested that the urine of tuberculosis suspects might be tested for these by injecting concentrates of it into a known tuberculin-hypersensitive skin and comparing the cutaneous response with that occasioned by tuberculin controls. Lanz (1920) and Imhof (1920) applied fundamentally the same hypothesis to the development of a serum test. Numerous efforts to confirm these observations have led to an accumulation of statistical data that have thus far proved inconclusive.

FLOCCULATION TEST

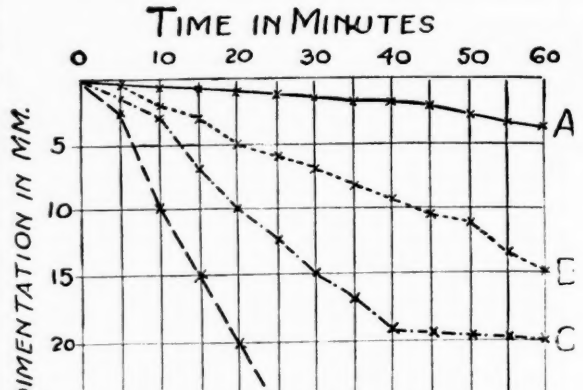
The flocculation test of Daranyi (1922) is dependent on the fact that a substance (probably globulin) may be precipitated from a high percentage of tuberculous sera by an alcohol-salt solution mixture. Convincing evidence of its real diagnostic usefulness is lacking. Though positive in a very large number of advanced active cases, its value in picking up the early case of tuberculosis is practically nil.

PRECIPITIN TEST

Agglutinin and precipitin reactions in tuberculosis have been very largely abandoned, since a general lack of specificity has militated against any possible clinical application. However, Doan, working with a tubercle-bacillus fraction furnished him by Anderson, has described very recently (May, 1929) a precipitin test which is promising. Though still entirely in the experimental stage, the test is of more than ordinary interest; for, if critical study eventually proves its value, its simplicity of technique might conceivably bring it into very general clinical use.

COMMENT

From the foregoing, it is obvious that today, at least, serological methods are of comparatively minor importance in the diagnosis of tuberculosis. Even tuberculo-complement fixation merely furnishes confirmatory evidence for a diagnosis already made by the less technical but more fundamentally important means, such as the study of clinical history, physical signs, and sputum. In the words of Dr. Krause, "The laboratory diagnosis of the ordinary case of tuberculosis can be accomplished by simple methods in an ordinary physician's hands in an ordinary physician's office."



Cell sedimentation curves according to Cutler's method. A, Normal. B, Pulmonary quiescence. C, Slight to moderate activity. D, Moderate to marked activity.

THE IODINE EDUCATIONAL BUREAU

A new organization known as the Iodine Educational Bureau has opened offices at 64 Water Street, New York City. Mr. J. J. Nichols is Director of the Bureau, which is supported by the Iodine Producers Association of Chile, South America.

The Bureau will collect and disseminate dependable information about iodine and iodine compounds. A large amount of research work will be undertaken, a fellowship already being established at Mellon Institute, and several other fellowships will shortly be established at other institutions to follow up special lines of research investigation. The Bureau will be ready to co-öperate at all times with others doing research work on the application of iodine in agriculture, industry, animal husbandry and in the professions of medicine, dentistry, pharmacy and veterinary medicine.

THE THIRTEENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS

(Continued from page 701, issue of October 3)

Drs. S. Woronoff and G. Alexandrescu of Paris reported the "Physiological Results of Testicular Grafting in Relation to the Histological Aspect of the Grafts Removed at Intervals During Four and a Half Years Following the Operation". According to these men the successful results are now quite definitely established. There is no notable change during the first two months; then there is a gradual improvement in muscular strength, better appetite, better working of organs hitherto enfeebled, and, in the case of men, greater capacity for intellectual work, lower blood pressure, and better metabolism. These symptoms are very marked during the first 2-3 years but fall off gradually until, in the fifth year, they disappear. Others have studied the various histological aspects of sections of grafts removed from animals and men in relation to the successive physiological changes. Thirty of these histological sections and ten microscopic photographs which were shown at the Congress illustrated the histological changes observed in the grafts from

twelve hours after the operation up to four and a half years. At first they noticed a kind of disorganization of the tissues. Later one sees a reorganization of the grafts and the formation of numerous ducts. The histological aspect is no longer that of a normal testicle, but two clearly distinguished zones. The peripheral zone, well vascularized, where the seminiferous ducts preserve the epithelioid cells, the young connective tissue and elements of infiltration. In the center the histological elements are in a state of hypobiotrophy. Sections removed after two years and two years and a half present the same aspect, but as time goes on, the fibrous transformations or evolutions of the cells become more and more evident and after three and a half years the fibrous tissue predominates. In a section removed four and a half years after transplantation, and shown at the Congress, the scarcity of epithelial elements and the transformation of the grafts into fibrous tissue was noticed. The physiological results, which may be attributed to the hormonic activity of the grafts, then disappear.

"Vicarious Function of the Sweat Glands for the Kidneys in Nephritis" was investigated by Dr. Frederick M. Allen of Morristown, New Jersey. According to Dr. Allen, dry heat, which is recognized as less debilitating than humid heat, can be used in suitable nephritic cases to produce 4 liters or more of perspiration daily over long periods without the prostration which impaired the usefulness of former methods. Some of the observations made in this work were: 1: The chief nitrogenous constituent of the sweat is urea, which may rise above 1000 mgm. per cent. Creatinine has been found to about 12 mgm. per cent. Aromatic substances were not found, i.e., indican, etc. 2: The concentration of the above substances in the sweat is governed chiefly but not wholly by the concentration in the blood. 3: The chief inorganic constituent of the sweat is sodium chloride, often above 200 mgm. per cent. Phosphates appear in very low values. 4: The sodium chloride concentration in the sweat is not parallel with that in the blood, but apparently governed more by other factors. 5: The vicarious function of the skin for the kidneys by the new dry heat treatment can reduce the blood urea to degrees never before demonstrated, e.g., from 180 mgm. to 60 mgm., and in some cases of chronic nephritis this improvement can be long maintained. 6: Symptoms are correspondingly relieved, confirming the conception of uremia as due to retention. 7: The clearing up of edema by dry heat is more effective than that of any other means. This is physiologically important in relation to the conception of tissue retention. 8: Hydremia can also be reduced. 9: Blood pressure is relatively little affected. 10: Cardiac weakness usually does not contraindicate the treatment, but limits are imposed by the special vascular abnormalities present in some cases of nephritis and hypertension. In severe cases only moderate sweating can often be tolerated. In the severest cases heat may cause collapse, or may produce fever instead of sweating.

"External and Internal Secretions of the Pancreas and their Interrelation" was the subject of an address by Dr. W. N. Boldyreff. Previous experiments showed that the pancreatic juice contains a strong glycolytic ferment which splits glucose in vitro with the formation of lactic acid. The administration of zymogen pancreatic juice into the blood of animals is tolerated without any harm. The same dosage of active juice kills the animals in one to two days with the picture of general poisoning. Under normal conditions the pancreatic juice is quickly absorbed into the blood. The exclusion of the pancreatic juice from the intestine, by ligation of the ducts, pancreatic fistula and pancreatectomy, causes an increase of blood sugar content. Reports show that substances stimulating pancreatic secretion lower the blood sugar level. Ephraim Boldyreff showed that absorption of pancreatic juice by the blood is followed by a drop in the blood sugar. The conclusion was drawn that pancreatic juice in normal conditions enters the blood and partly or entirely breaks down sugar. This is ascribed to the action of internal secretion. Dr. W. N. Boldyreff does not believe that the impossibility of the secretion of the islands of Langerhans to enter the intestine with the external pancreatic secretion is proven. Pancreatic preparations and pancreatic juice in depancreatized animals and in diabetics assist the action of insulin. Therefore, the external pancreatic secretion may serve as an important remedy in the clinic in cases of pancreatic affliction as an addition to insulin and other proven means of treatment.

"The Nature of the Material Effective in Pernicious Anemia" was the subject of an address by Drs. Edwin J. Cohn, Thomas L. McMeekin and George R. Minot. The value of liver in pernicious anemia stimulated investigation of the active liver substance. It is soluble in water alone or with alcohol. Isoelectric precipitation and heat coagulation freed the extracts of protein; ether of lipoids; and lead acetate of carbohydrates. Since the active principle was neither protein, carbohydrate, nor lipoid, and was precipitated by mercuric acetate, and by phosphotungstic acid, it appeared to be a nitrogenous base or polypeptid. Although but slightly soluble in 95 per cent. alcohol, the active principle has been dissolved in it following regeneration of the precipitated phosphotungstates. The undissolved proteoses, peptones and polypeptids were inactive. The active solution gave no precipitate with trichloracetic acid or tungstic oxide, no increase in ameno-nitrogen upon hydrolysis, and no biuret test, indicating that the active principle was not a peptide, but rather a nitrogenous base. Upon concentrating this alcoholic solution, the active principle is precipitated whereas depressor substances remain largely dissolved. The precipitate which was active in a small amount has been successfully injected intravenously. The fraction thus employed consists largely of nitrogenous bases. Purine bases have been removed, and no material is precipitated by flavianic acid from neutral solution. Silver precipitable material may be removed earlier in the process, but in highly purified solutions heavy metals appear to destroy activity. The purest active fraction dissolves in water, alcohol, phenol, glycerol, formamide, and acetic acid. Combined with acetic acid, it dissolved in such organic soluents as chloroform and carbon tetrachloride. A fraction is abstracted by pyridine and by butyl alcohol. The color reactions of certain specific groups are being followed, as are acid and basic dissociation constants in the further separations that are being made in an attempt to isolate the active principle.

Drs. Bela Halpert and Milton T. Hanke reported their views on "The Excretion, by the Liver, and

Accumulation in the Gall Bladder of Certain Organic Compounds, Particularly Dyes". They developed quantitative methods for estimating salicylic acid, diiodosalicylic acid, methylene blue, eosine, erythrosine, rose bengal and tetraiodophthalein in bile. Salicylic acid and diiodosalicylic acid are not excreted into the bile. Eosine, erythrosine and rose bengal are largely excreted into the bile; but they do not accumulate in the gall bladder because they are absorbed by the gall bladder mucosa about as readily as are the normal bile constituents. Only a small portion of the administered methylene blue appears in the bile. Tetraiodophthalein, or at least some compound containing iodine, is largely excreted in the bile. Methylene blue and tetraiodophthalein accumulate in the gall bladder. Experiments were conducted on rabbits and the chemicals injected intravenously.

"The Effects of Ether Anaesthesia on the Inorganic Constituents of the Blood" was the subject of a discourse by Drs. E. Lipow, Wallis K. Weare, and C. I. Reed. As a preliminary to a study of the influence of the autonomic system on the inorganic blood constituents, it was necessary for these investigators to establish the magnitude and direction of alterations induced by ether anaesthesia in dogs. Observations extended over two periods. In fourteen experiments they found that plasma calcium was increased markedly in two animals. In two there was a decrease during the first half hour, with an increase above the initial level during the second hour. In the other ten, there was a progressive fall. In fourteen determinations of inorganic phosphorus, the end result was invariably a pronounced increase, with minor fluctuations during the first hour in five cases. Magnesium varied greatly in the course of experiments and there was no constancy among different animals. Potassium showed a tendency to decrease during the first hour, followed by a pronounced increase during the second hour, frequently above the initial level. Sodium generally decreased slightly during the first hour, followed by a progressive increase. In two instances the increase was apparent at the end of the first half hour.

"The Importance of the Thyroid Gland in the Nervous Activity of Animals" was reported by Dr. Boris Zavadovsky. According to him, it is hardly to be doubted that the thyroid gland has great importance in human mental activity. The relation may be illustrated by the behavior of cretins with innate or acquired hypofunction of the thyroid. As to other animals marked changes have not been observed in the mental activity of animals after complete removal of the thyroid. In collaboration with a group of students the author has followed in detail the influence of hyper- as well as hypofunction of the thyroid on the nervous activity of animals by means of the objective methods of conditioned reflexes. The classical methods of the salivary reflex worked out by Pavlov and motor reflexes in dogs after Bechterev have been used; in chickens an original method was worked out in detail for the study of the food motor reflex with the following results; 1: Hyperthyroidisation with large singular doses in chickens as well as in dogs has shown a double phased action, degradation and removal of the conditioned reflexes in the first day after feeding with thyroid gland and increase of nervous excitability and of the conditioned indices beginning with the 3rd to the 5th day. 2: When fed with small doses of the thyroid gland daily a general increase of the conditioned indices is observed whereas all the reactions become more exact including the differentiation reaction. 3: Simultaneous study of the unconditioned salivary secretion does not allow interpreting the effect of the experiments as a mere increase of excitability of the peripheral apparatus of the salivary gland but indicates some immediate change in the activity of the brain cortex brought about by hyperthyroidisation. 4: In two dogs with fully developed conditioned salivary reflexes the thyroid glands have been entirely removed and changes brought about in the conditioned reflex activity of the animals have been systematically followed in the course of 8 or 9 months up to the death of the animals which was caused by cachexia. 5: A sharp decrease of the reflex indices has been noted together with an elongation of the latent period and a diminution in the quantity of the secreted saliva; all these changes have begun in the second month after the operation and have reached about 50 per cent. of their initial value. This decrease of the reflex indices is accompanied by no alteration in the unconditioned saliva secretion, this being in contradiction with the general idea of a decrease of the food excitability accompanying hyperthyreosis but their observations are in agreement with others who have observed an increase in the motor activity of the alimentary tube in thyroidectomized dogs. These facts make it absolutely certain that the activity of the brain cortex as an apparatus controlling the conditioned reflexes is being disturbed after thyroidectomy, which causes a decrease of the general excitability. It is further shown that in the course of the last month preceding the death of the animals the conditioned reflexes in thyroidectomized animals show some increase of their principal indices. Also that when fed with small doses of the thyroid gland these indices return to their normal value. The above data make it hardly doubtful that the normal activity of the thyroid gland has a great importance in supporting the excitability of the brain cortex not only in man but in other animals as well.

Dr. Casimio Funk apparently convinced some of the members of the Congress that he could become the world's richest and most influential person, if he chose to capitalize his researches when he announced his discovery of a simple and certain way to make old men young and vigorous again. He submitted the details of his long research and recent laboratory experiments. Many agreed with some of the speculations on what wealthy men would be willing to pay for the boon of going back from 70 or 80 to their early twenties. Fees aggregating well over $1,000,000,000 had been tentatively tabulated in a few minutes. The interesting fact was announced in connection with Dr. Funk's revelation that his researches had been financed by a group of prominent persons in Chicago and New York. One of these men at one time went to Paris to submit to an operation by Woronoff. Later reports were to the effect that this operation had been unsuccessful. Plans are now being made by Dr. Harry Benjamin, Dr. Funk and Dr. Benjamin Harrow, and by a group of laymen to begin at once a series of actual tests upon men. This work it was stated will be done in New York. The scientists expect to concentrate the new substance to be used in a tablet form which will be fed to middle-aged and elderly men selected for the

test. It was admitted that a certain element of danger for the human subjects exists, as until there has been a long careful series of experiments, it is impossible to know just how strong the doses should be or how long they should be continued. There is no intention of exploiting the discovery for financial gain, Dr. Funk and his associates declared. Their work has already been referred to in the press and when the tablets are perfected and the proper doses standardized by actual experiment upon a number of men who are willing to undergo the tests, further details will be made public and the tablets will be available for prescription by physicians like any other drug.

The changing customs have led to the introduction of more social features in the last Congress than were arranged for the earlier meetings. The earlier sessions were more generally devoted to strictly scientific discussions.

In these reports the JOURNAL is indebted to a reporter who has had his work supervised and revised.

Some reports of specialized technical work have not been referred to because they can be appreciated only by trained research workers.

WEEKLY HEALTH INDEX

Telegraphic returns from 64 cities with a total population of twenty-nine million for the week ending September 21 indicate a mortality rate of 10.2 as against a rate of 11.1 for the corresponding week of last year. The highest rate (19.8) appears for Memphis, Tenn., and the lowest (4.8) for Youngstown, Ohio. The highest infant mortality rate (207) appears for Flint, Mich., and the lowest for Albany, N. Y., Fall River, Mass., Kansas City, Kans., Somerville, Mass., and Tacoma, Wash., which reported no infant mortality.

The annual rate for 63 cities is 13.2 for the thirty-eight weeks of 1929, as against a rate of 13.0 for the corresponding weeks of 1928.—*Department of Commerce.*

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

The Quarterly Meeting and Clambake will be held in New Bedford, Mass., Wednesday, October 16, 1929, on Invitation of the Mayor and Board of Health. Program begins at 10.30 A. M.

PROGRAM

10.30 A. M. Meet at Health Department, Williams Street, New Bedford. Inspection trips, including the garbage plant where the Superior Incinerator is in operation, the only one of its kind in New England; visit to screenhouse, where the intercepting sewer system will be explained by City Engineer Nye.

1 P. M. CLAMBAKE AND LOBSTER DINNER, at Acushnet Park Pavilion, Clark's Point. Subscription $1.50.

After the Clambake entertainment provided at estate of Colonel E. H. R. Green, including inspection of the whaler, Charles F. Morgan, ready for a whaling voyage. Members will go to New Bedford by auto, if possible, and for those who come by train, automobiles will be provided by the New Bedford Health Department.

STEPHEN L. MALONEY, *Secretary.*

COMMONWEALTH OF MASSACHUSETTS BOARD OF REGISTRATION IN MEDICINE

RESULTS OF THE JULY EXAMINATIONS—1929

Medical College Graduates	Number Registered	Rejected
Tufts College Medical School	37	1
Harvard Medical School	14	0
Middlesex Coll. of Med. and Surgery	9	9
Chicago Medical College	0	1
Kansas City Uni. Phys. and Surgeons	0	4
Missouri College of Med. and Science	0	3
Des Moines Still College of Osteopathy	0	2
Mass. College of Osteopathy	4	13
Philadelphia College of Osteopathy	0	3
University of Athens	0	2
St. Louis College of Phys. and Surgeons	0	1
University of Virginia	1	0
University of West Tennessee	0	1
University of Berne	0	1
Kirksville Coll. of Osteopathy & Surgery	3	2
University of Michigan	4	0
University of Montreal	1	1
University of Pennsylvania	1	0
Coimbra University	1	0
Chicago College of Osteopathy	0	1
University of Maryland	1	0
St. Louis University	1	0
Jefferson Medical College	2	0
Boston University School of Medicine	9	0
College of Physicians and Surgeons, Boston	3	4
Bowdoin	1	0
Georgetown University	2	0
University of Rome	1	1
Creighton Medical College	1	0
Cornell	1	0
University of Vermont	2	0
Baylor University	1	0
McGill University	1	0
Total	101	50

THE APPOINTMENT OF DR. CLARENCE C. LITTLE

Dr. Clarence C. Little, former president of the University of Michigan, has been appointed managing director of the American Society for the Control of Cancer.

Dr. Little is in charge of the Roscoe B. Jackson Memorial Laboratory for Cancer Research at Bar Harbor.

MASSACHUSETTS MORTALITY STATISTICS: 1928

Washington, D. C., September 23, 1929.—The Department of Commerce announces that the 1928 death rate for Massachusetts was 1,189.6 (per 100,000 population) as compared with 1,161.8 in 1927.

Increases in rates (per 100,000 population) from those of the preceding year were from the following principal causes: diseases of the heart (242.6 to 261.0), cerebral hemorrhage and softening (95.1 to 98.9), diabetes mellitus (20.4 to 21.6), and cancer (128.5 to 129.7). Increases were shown also for pneumonia, all forms (93.5 to 104.0), measles (2.1 to 6.5), influenza (9.4 to 13.8), whooping cough (3.7 to 4.9), and cirrhosis of the liver (5.3 to 6.5).

Cause of death	Deaths in Massachusetts			
	Number		Rate per 100,000 estimated population	
	1928	1927	1928	1927
ALL causes 1/	51,034	49,285	1,189.6	1,161.8
Typhoid and paratyphoid fever	35	42	0.8	1.0
Malaria	6	1	0.1	2/
Smallpox	-	-	-	-
Measles	278	91	6.5	2.1
Scarlet fever	92	145	2.1	3.4
Whooping cough	209	155	4.9	3.7
Diphtheria	251	275	5.9	6.5
Influenza	590	400	13.8	9.4
Dysentery	23	16	0.5	0.4
Erysipelas	117	127	2.7	3.0
Acute anterior poliomyelitis	65	170	1.5	4.0
Lethargic encephalitis	57	61	1.3	1.4
Meningococcus meningitis	46	53	1.1	1.2
Tuberculosis (all forms)	3,109	3,202	72.5	75.5
Of the respiratory system	2,695	2,787	62.8	65.7
Of the meninges, central nervous system	189	188	4.4	4.4
Other forms	225	227	5.2	5.4
Syphilis 3/	417	412	9.7	9.7
Cancer and other malignant tumors	5,562	5,449	129.7	128.5
Rheumatism	110	123	2.6	2.9
Pellagra	11	10	0.3	0.2
Diabetes mellitus	926	864	21.6	20.4
Meningitis (nonepidemic)	112	94	2.6	2.2
Cerebral hemorrhage and softening	4,242	4,034	98.9	95.1
Paralysis without specified cause	99	97	2.3	2.3
Diseases of the heart	11,197	10,293	261.0	242.6
Diseases of the arteries, atheroma, aneurysm, etc.	1,987	1,917	46.3	45.2
Bronchitis	248	271	5.8	6.4
Pneumonia (all forms)	4,462	3,967	104.0	93.5
Respiratory diseases other than bronchitis and pneumonia (all forms)	258	261	6.0	6.2
Diarrhea and enteritis	683	758	15.9	17.9
Diarrhea and enteritis (under 2 years)	565	635	13.2	15.0
Diarrhea and enteritis (2 years and over)	118	123	2.8	2.9
Appendicitis and typhlitis	582	571	13.6	13.5
Hernia, intestinal obstruction	399	421	9.3	9.9
Cirrhosis of the liver	277	226	6.5	5.3
Nephritis	3,525	3,562	82.2	84.0
Puerperal septicemia	160	172	3.7	4.1
Puerperal causes other than puerperal septicemia	347	346	8.1	8.2
Congenital malformations and diseases of early infancy	2,754	3,014	64.2	71.1
Suicide	542	465	12.6	11.0
Homicide	79	85	1.8	2.0
Accidental and unspecified external causes	2,801	2,771	65.3	65.3
Burns (conflagration excepted)	195	201	4.5	4.7
Accidental drowning	315	295	7.3	7.0
Accidental shooting	29	28	0.7	0.7
Accidental falls	731	692	17.0	16.3
Mine accidents	-	-	-	-
Machinery accidents	61	57	1.4	1.3
Railroad accidents	119	119	2.8	2.8
Collision with automobile	17	16	0.4	0.4
Other railroad accidents	102	103	2.4	2.4
Street-car accidents	47	64	1.1	1.5
Collision with automobile	3	12	0.1	0.3
Other street-car accidents	44	52	1.0	1.2
Automobile accidents (excluding collision with railroad trains and street cars)	724	696	16.9	16.4
Injuries by vehicles other than railroad trains, street cars, and automobiles 4/	56	63	1.3	1.5
Excessive heat (burns excepted)	6	7	0.1	0.2
Other external causes	518	549	12.1	12.9
All other defined causes	4,313	4,296	100.5	101.3
Unknown or ill-defined causes	62	68	1.4	1.6

1/ Exclusive of stillbirths.
2/ Less than one-tenth of 1 per 100,000 population.
3/ Includes tabes dorsalis (locomotor ataxia) and general paralysis of the insane.
4/ Includes airplane, balloon, and motor-cycle accidents.

The death rate from all accidental causes was the same for 1928 as for 1927 (65.3 per 100,000 population), and there were only negligible increases, or decreases, for the different types of accidents. Those showing the greatest increases were accidental falls (16.3 to 17.0) and automobile accidents, excluding

collisions with railroad trains, and street cars (16.4 to 16.9).

Significant among the decreases in rates from 1927 to 1928 were those from the following principal causes: tuberculosis, all forms (75.5 to 72.5) and nephritis (84.0 to 82.2). Other decreases were shown for congenital malformations and diseases of early infancy (71.1 to 64.2), acute anterior poliomyelitis (4.0 to 1.5), diarrhea and enteritis, under 2 years (15.0 to 13.2), and scarlet fever (3.4 to 2.1).

The estimated population in 1928 was 4,290,000 and in 1927 was 4,242,000.

ARTIFICIAL IMMUNITY TO SCARLET FEVER

The United States Public Health Service has published an opinion to the effect that the application of the immunizing toxin for scarlet fever has not been used long enough to warrant statements as to the duration of the immunity so produced.

The use of the Dick test will determine whether a given child is immune and if not naturally immune or if artificial immunity has been lost, repetition of the immunizing toxin is in order.

CORRESPONDENCE

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn St., Chicago, Ill.,
September 28, 1929.

Managing Editor,
NEW ENGLAND JOURNAL OF MEDICINE:

In addition to the articles enumerated in our letter of August 30, the following have been accepted:

Abbott Laboratories
Metaphen 2500

Hollister-Stier Laboratories
Bacillus Acidophilus Culture—Hollister-Stier
Acne Vaccine
Pertussis Bacillus Vaccine
Typhoid-Paratyphoid Prophylactic
Staphylococcic Vaccine

Mead Johnson & Co.
Sobee

Sandoz Chemical Works, Inc.
Calcium Gluconate—Sandoz

E. R. Squibb & Sons
Diphtheria Toxoid—Squibb, 30 c.c. vial

Yours truly,
W. A. PUCKNER, *Secretary*,
Council on Pharmacy and Chemistry.

NEWS ITEMS

RECOVERY OF DR. HAROLD E. DIEHL—Dr. Harold E. Diehl of 475 Commonwealth avenue, Boston, has recovered from a prolonged illness and has again resumed his practice.

AN ADDRESS ON THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS—Dr. John Alexander of Ann Arbor will speak on "The Surgical Treatment of Pulmonary Tuberculosis" in the Thorndike Amphitheatre of the Boston City Hospital on Friday, October 11, 1929, at 12:00 o'clock.

RESIGNATION OF MISS ELLEN C. DALY—Miss Ellen C. Daly has resigned as superintendent of nurses of the Boston City Hospital after eighteen years of service.

The report states that the trustees reluctantly accepted the resignation and referred to Miss Daly as one of the ablest executives in her field of work.

OBITUARY

RESOLUTIONS ON THE DEATH OF DR. JAMES S. STONE

At a meeting of the Staff of the Children's Hospital Wednesday, October 2, 1929, the following resolutions were adopted:

The untimely death on Saturday, September 28, 1929 of Dr. James Savage Stone, brought to a close over thirty years of devoted service to the Children's Hospital.

Throughout this long period he saw the hospital increase its usefulness to the community and this growth was in large measure due to his farsightedness and unselfish devotion. But with the growth of the hospital and its ever increasing number of patients, Dr. Stone never lost the extraordinary personal touch that so characterized his relations with the individual child and his parents. His ability to make friends with the sick child of any class or age and his exceptionally keen clinical judgment and wide experience often made it possible for him to arrive at a correct diagnosis when others less gifted would fail.

His unfailing good nature and sense of humor, his sympathetic relations toward his associates, whether doctors, nurses or internes, made him one with whom it was a great privilege to be associated. The confidence he inspired made him the one to whom all turned in times of difficulty and from whom they were sure of wise advice, kindly and generously given.

It is to be hoped that those of us who have been privileged to work with Dr. Stone may in some degree pass on some of his spirit of kindliness, wise teachings and common sense, to those who have not had our unusual opportunity.

Be it therefore resolved that these resolutions be incorporated in the minutes, and a copy be sent to Mrs. James Savage Stone.

NOTICES

ANONYMOUS COMMUNICATIONS

The editorial office of this JOURNAL receives anonymous communications from time to time with requests for discussion of the subject matter presented. It is the general custom among editors to decline to make reference to unsigned communications. If anyone has ideas of value which should be put before the profession, the author's name should appear, or at least be known by the editors.

REMOVALS

Dr. Burton E. Hamilton has moved his office from 475 Commonwealth Avenue to the Longwood Medical Building, 319 Longwood Avenue, Boston.

Jacob Goldwyn, M.D., announces the opening of an office at 390 Main Street, Worcester, Massachusetts.

Dr. James H. Gettings has moved from 1075 Boylston Street to 56 Bay State Road, Boston.

Newton S. Bacon, M.D., announces the removal of his office from 1688 Massachusetts Avenue to 3 Hurlbut Street, Cambridge, Massachusetts.

DR. ALBERT ALLEMANN HAS RESIGNED AS EDITOR OF THE *MEDICAL INTERPRETER*

To the Editor of the JOURNAL.

Sir:

I wish to inform the subscribers of the *Medical Interpreter* that I resigned as editor of this publication in December, 1928, and that I am no longer responsible in any manner for the actions of its promoters.

ALBERT ALLEMANN, M.D.,
Washington, D. C.

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following open competitive examination:

Associate Medical Statistician

Applications for associate medical statistician must be on file with the Civil Service Commission at Washington, D. C., not later than October 23.

The entrance salary is $3,200 a year.

Full information may be obtained from the United States Civil Service Commission, Washington, D. C., or from the Secretary of the United States Civil Service Board of Examiners at the post office or courthouse in any city.

REPORT AND NOTICES OF MEETINGS

MASSACHUSETTS MEDICO-LEGAL SOCIETY

The Massachusetts Medico-Legal Society held its fall meeting in the Warren Museum at the Harvard Medical School on Wednesday, October 2, at 2:30 P. M. After the reading of the minutes of the June meeting and other minor business transacted, Dr. G. B. Magrath made some introductory remarks on the subject of identification, illustrating his remarks by alluding to the S-4 submarine accident of a few years back in which case all the 40 bodies were speedily identified by means of fingerprints.

The speaker of the occasion was James R. Claflin, Inspector in Charge of the Bureau of Identification, City of Boston. His subject was "Identification in its Medico-Legal Relations." The first methods of identification of criminals in Boston were front view photographs; no profile pictures were taken and the photos were filed in galleries. In the seventy years since then great changes have been made. In 1882 Bertillon, a French doctor, applied medical statistics to criminology. Under his system the following measurements were taken: the height, reach, trunk length, length and width of head, and the length of the right ear, left foot, left middle finger, and left forearm. These measurements were put on card and filed according to the head length. The one defect in this system was the measuring of criminals in the adolescent age, where the measurements naturally changed. Later on, a right profile picture of the subject and a description of marks, scars, or moles were added on the back of the card.

In 1901 Sir Edward Henry put into use the fingerprint system of classification, using the entire hand and also the feet. It was not his invention since the prints had been used in China hundreds of years before on papers showing ownership of lands, and in India for coolie identification. Boston does not now use the Henry System, but a modification of it.

Inspector Claflin pointed out and illustrated by lantern slides how fingerprints vary in the outlets of the sweat glands and in lines, ridges, and loops. Fingers vary greatly in the degree of wear they have had, such as those of bricklayers and plasterers, but there has been no difficulty yet in identification. Occasionally, criminals attempt to distort their fingerprints by the use of acids, but the ridges are so deep in the skin that too much of the finger has to be cut or burned away to offer any considerable difficulty in identification.

It is estimated that 50,000 people are buried each year in the United States unidentified. Photographs of dead people, while of some help, are not nearly as satisfactory as fingerprints. In Argentina where fingerprinting of everyone is compulsory, identification is sure. The system is of such perfection now that even in the largest collection, the classification at the top of the card will find a man in five minutes. These classifications together with fingerprints and photographs may be sent by telephoto anywhere. Prints may be made from linen collars, blotters, cigarette butts, and a process is being worked out now by which prints on another human body may be developed. Fingerprints have been proved to be accurate for purposes of identification anywhere in the interval between a six months' foetus to a body dead half a year. Twins of the same sex present no difficulties to the fingerprint expert.

After the formal talk Inspector Claflin demonstrated the method of taking fingerprints. The meeting was exceptionally well attended despite the inclement weather and was of more than usual interest.

NEW ENGLAND ROENTGEN RAY SOCIETY

The first meeting of the New England Roentgen Ray Society will be held Friday, October 18, 1929, at the Boston Medical Library.

The subject will be "Aneurysmal Dilatation of the Left Auricle" by Dr. David Steel of Cleveland, Ohio. The paper will be discussed by Dr. Paul White and Dr. George Holmes.

THOMAS R. HEALY, *Secretary.*

SOUTH END NEIGHBORHOOD MEDICAL CLUB

The first regular meeting this fall of the South End Neighborhood Medical Club will be held on Tuesday, October 15, 1929, at 12 noon, at the Headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston.

The speaker will be Dr. Charles H. Lawrence, Chief of the Endocrine Service, Evans Memorial,

Boston, and his subject, "Common Endocrine Syndromes". As this subject is becoming more and more interesting, Members of the Club will surely want to hear him.

A program of interesting speakers and subjects is now being prepared for our meetings this year. The members are urged to attend promptly at noon so that our meetings may close at 1:15 P. M. The usual luncheons will be served. All physicians are cordially welcome.

BERKSHIRE COUNTY MEDICAL SOCIETY

The next meeting of this Society will be October 30 at the Park Club, Pittsfield, at two o'clock.

The Speaker will be Dr. Chevalier Jackson of Philadelphia.

The subject will be: "Prevention of a Certain Class of Accidents to Children." This meeting will be for semi-professional workers, child-welfare organizations, as well as hospital authorities and student nurses. An invitation is also extended to the laity who might be interested.

HUGH DOWNEY, *Secretary.*

ESSEX NORTH DISTRICT MEDICAL SOCIETY

Eighty-eighth Quarterly Meeting of the Society will be held at North Reading State Sanatorium (Tuberculosis), Lowell Road, North Reading (Telephone No. Reading 18), upon invitation of Sumner H. Remick, M.D., Director of Tuberculosis, of the State Department of Health, Wednesday, October 16, and will be a joint meeting with these District Societies, Middlesex North and East, and Essex South, and the program is as follows:

2 to 4, Inspection of the Sanatorium.

4 P. M. (a) Welcome address by George H. Bigelow, M.D., of Boston, Commissioner of Public Health of Massachusetts. (15 minutes.)

(b) Address by Thomas J. O'Brien, M.D., of Boston, Executive Assistant to the President of the Massachusetts Medical Society. (15 minutes.)

(c) Clinic by Sanatorium Staff. (1 hour.)

(d) Address by physician whose name and subject will be announced later. (1 hour.)

(e) Supper at 6:30 sharp.

Meeting of the Censors will be held at Hotel Bartlett, 95 Main Street, Haverhill (Telephone 3430), Thursday, November 7, at 2 P. M. sharp. Candidates should present diploma to the Secretary one week in advance.

ROLAND L. TAPPAN, M.D., *President.*
October 3, 1929.

J. FORREST BURNHAM, M.D., *Secretary.*
567 Haverhill Street, Lawrence, Mass.

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The monthly clinical conference of the New England Hospital for Women and Children will be held at the Hospital, Dimock Street, Roxbury, on Thursday, October 17, at 8 P. M., with the following program:

Cases of Prematurity, with causes; Gastro-intestinal Hemorrhage; Demonstration of a burn.

ALICE H. BIGELOW, *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

October 7-19—New York Academy of Medicine. Detailed notice appears on page 657, issue of September 26.

October 10-11—Vermont State Medical Society. Detailed notice appears on page 705, issue of October 3.

October 13-18—General meeting of the International Society of Medical Hydrology and International League for Combating Rheumatism. Detailed notice appears on page 288, issue of August 8.

October 14-18—The next annual Clinical Congress of the American College of Surgeons will be held in Chicago.

FRANKLIN H. MARTIN, M.D., General Director,
American College of Surgeons,
40 East Erie Street, Chicago.

October 15—South End Neighborhood Medical Club. Detailed notice appears on page 746.

October 16—The Quarterly Meeting and Clambake, Massachusetts Association of Boards of Health. Complete notice appears on page 743.

October 17—New England Hospital for Women and Children. Detailed notice appears elsewhere on this page.

October 18—New England Roentgen Ray Society. Detailed notice appears on page 746.

October 21, 22, 23, 24, 25—International Assembly of the Inter-State Post-Graduate Medical Association of North America. For detailed notice see page 341, issue of August 15.

November 4, 5, 6 and 7, 1929—Clinical Congress and Eighth Annual Meeting of the American College of Physical Therapy. See page 149, issue of July 18, for details.

December 2-6—The Radiological Society of North America. Complete notice appears on page 149, issue of July 18.

May 5-10, 1930—First International Congress on Mental Hygiene. See page 191, issue of July 25, for details.

DISTRICT MEDICAL SOCIETIES

Berkshire County Medical Society

October 30—Complete notice appears elsewhere on this page.

Essex North District Medical Society

October 16—Detailed notice appears elsewhere on this page.

Essex South District Medical Society

October 16—See notice under Essex North District Medical Society, which appears elsewhere on this page.

Franklin District Medical Society

The meetings of the Franklin District Medical Society will be held at the Weldon Hotel, Greenfield, Mass., on the second Tuesdays of November, January, March and May, at 11 A. M.

CHARLES MOLINE, Secretary.

Hampden District Medical Society

The next meeting will be held October 22 at the Springfield Academy of Medicine.

The program will be arranged by Dr. L. E. Phaneuf and the Section of Obstetrics and Gynecology.

Details will appear later.

HERVEY L. SMITH, Secretary.

Hampshire District Medical Society

The meetings of Hampshire District will occur at 11 A. M. the second Wednesdays of December, February, and April and will be held at the Dickinson Hospital, Northampton. The annual meeting will be held in May.

LUTHER O. WHITMAN, M.D., Secretary.

Middlesex East District Medical Society

October 16—Joint meeting with Middlesex North and Essex North and South. See notice under Essex North District Medical Society, which appears elsewhere on this page.

November 13—At Reading.

January 15—At Boston, Harvard Club.

March 12—At Melrose.

May 13—At Unicorn Country Club.

ALLAN R. CUNNINGHAM, Secretary.

Middlesex North District Medical Society

October 16—See notice under Essex North District Medical Society, which appears elsewhere on this page.

Middlesex South District Medical Society

October 17—Newton Hospital. Surgical, medical and pathological demonstrations. Speaker and complete program to be announced later.

October 29—This meeting comes at the invitation of Plymouth District Medical Society, to be held at Massasoit Hall, 6 Main Street, Brockton, at 8 P. M. Dr. Cheva-

lier Jackson of Philadelphia will give an address, "Bronchoscopy as an Aid to the Internist and Surgeon in the Diagnosis and Treatment of Diseases of the Lung." Lantern slides and moving picture demonstrations.

ALEXANDER A. LEVI, M.D., Secretary.

November 6—Censors' meeting.

April 16, 1930—Annual meeting. Commander Hotel, Cambridge. Program to be announced.

Winter meetings—jointly with Suffolk District.

May, 1930—Censors' meeting.

ALEXANDER A. LEVI, Secretary.

Norfolk District Medical Society

Schedule of meetings for the year 1929-1930. Invitations have been sent to the speakers and the list is true only on condition of their acceptance.

October 29—Medfield State Hospital, Harding, Massachusetts. Papers by the Staff.

November 25—Roxbury Masonic Temple. Dr. Roger Graves, "Urology from the Standpoint of the General Practitioner." Surgical discussion. Medical discussion.

January 27, 1930—Roxbury Masonic Temple. "Recent Advances in Diagnosis and Treatment of Syphilis." Speaker to be announced.

February 24, 1930—Roxbury Masonic Temple, 8:00. Dr. Edwin H. Place has been invited to read a paper and has been given carte blanche in the selection of his subject.

March 24, 1930—Roxbury Masonic Temple. Dr. Burton E. Hamilton. Subject to be announced.

May 6, 1930—Annual Meeting. Program to be announced.

The Censors meet for the examination of candidates, November 7, 1929, and May 1, 1930, in the Roxbury Masonic Temple, 171 Warren Street, Roxbury, at 4:00 P. M.

Applications must be in the hands of the Secretary at least one week previous to date of examination.

Owing to inability to engage the Roxbury Masonic Apartments on the last Tuesday of the month, such meetings as will be held in the Roxbury Temple will be held Monday evenings as per the dates above.

FRANK S. CRUICKSHANK,
Secretary, Norfolk District Medical Society.

Plymouth District Medical Society

October 29—Massasoit Hall, 6 Main Street, Brockton, at 8 P. M. Speaker, Dr. Chevalier Jackson of Philadelphia. Subject: "Bronchoscopy as an Aid to the Internist and Surgeon in the Diagnosis and Treatment of Diseases of the Lung." Lantern slides and moving picture demonstration.

All physicians, members of the Massachusetts Medical Society are cordially invited to be present. **This is an important meeting.**

THOMAS H. McCARTHY, President.

BOOK REVIEWS

The Conquest of Cancer by Radium and Other Methods. By DANIEL THOMAS QUIGLEY. F. A. Davis Co., Philadelphia. 1929. $6.00.

To one not familiar with the established facts about cancer and its treatment, this may be a very interesting book, but to others it is a volume containing many erroneous statements, many statements not backed up by facts and impressions obtained by seeing the disease approached only from the radiological point of view. The writer has been a user of radium for fifteen years. He proceeds by pointing out the uselessness of many forms of treatment, including surgery, and develops his point that radium is the treatment of choice in the vast majority of cases.

The reviewer would not give the impression that the book has no value, for there are many excellent features. Many of the illustrations are good and this is true of certain portions of the text. However, there are so many statements that are seemingly faulty, that one would hesitate to recommend the book to one who was unable to separate the wheat from the chaff. Some of these statements are summarized below.

Pathogenic micro-organisms are present in all external tumors, having arrived there through irritation of various types. "The dominant thing, then, in the stimulating of cells to proliferate, cannot be other than the presence of low-grade pathogenic micro-organisms." Localization of blood stream organisms entering deep fascia, if in the back, causes lumbago, if in the neck, a stiff neck. "Slow poisonings by such localizations of micro-organisms is the cause of old age." Acidity is one of the requisites to the development of cancer. "No cancer ever grows with the irritation produced by micro-organisms." (Such statements are made without data substantiating them.)

Emphasis is laid on the poisoning from cancer, particularly from the mouth cancer. He has never seen cancer of the mouth metastasize below the clavicle, for the poisoning is so severe that death occurs before it has time to descend farther! Basal cell cancers are potentially squamous cell cancers. They are caused by *infection* deep in the skin possibly associated with injury. Hodgkin's Disease is "simple sarcoma of the lymph gland showing more than the ordinary reaction against the invading micro-organisms that have started the malignant process."

The writer is death on surgery. Operations on fibroids cause the development of sarcoma frequently! Biopsies are condemned. "The State of New York makes free diagnosis from tumor specimens, and thereby causes the death of many of her citizens." "Solid cancer is surrounded by a zone of liquid cancer which contains in suspension the seeds for the recurrence and the transplantation of the growth." He claims that 40 or 50 per cent. of all mouth cancers are in syphilitics. (Syphilis must be more prevalent in his State than in ours, for these figures are ten times too high.) He considers a proctoscope a dangerous weapon because of the danger of trauma. He has heard of no cures from secondary operations for recurrent cancer of the breast. "Practically all breast cancer statistics are worthless."

He divides cancer of the breast into (1) the malignant papilloma developing on the lining of a cyst, (2) malignancies arising in benign adenomas and (3) glandular carcinoma beginning in the glandular tissue of the breast. "In our experience, no cancer of the third type has ever been cured by operation alone." And yet a man with such experience and with such ignorance of surgical results writes a book on the "Conquest of Cancer." He states that the majority of recurrences take place in the first year and that with surgery alone over a ten-year period he had 75 per cent. recurrences in the first year. Now he uses pre-operative radiation and leaves the wound wide open and his one-year recurrences have dropped to 25 per cent. Experience in major hospitals the world over is quite unlike this experience. A recurrence during the first year usually means that the case was inoperable or that an inadequate operation has been done!

The author claims 90 per cent. cures for at least three years by radiation alone of 341 early cancers of the lip. If one gland is involved he plants radium in this gland, but if three or more glands are enlarged, the case is passed up as incurable. Again he shows lack of experience and familiarity with published end results. He condemns glandular dissections for disseminating disease if the glands are

malignant, and for robbing the patient of nature's protective measure if non-malignant. No distinction is made between upper and lower lips or between cancer of the skin over the lip and cancer on the mucous membrane, the treatment for which is entirely different.

The reviewer cannot endorse a book which fails to adopt established and proven principles and which accepts radiation therapy in place of methods about which the author apparently knows so little.

The Treatment of Fractures. By LORENZ BÖHLER, M.D. Authorized English Translation by M. E. Steinberg, M.S., M.D. Wilhelm Mandrich, Vienna, 1929.

Although a new figure to most American physicians, the author of this book has already established a reputation in Europe for his novel and interesting work in the treatment of fractures. As a surgeon in the Austrian Army during the World War he acquired an extensive experience in the treatment of bone injuries. Since the war his position as Chief Surgeon and Director of the Vienna Accident Insurance Hospital has afforded an unusual opportunity to supplement this experience, and to develop his ideas of fracture treatment. This is a hospital of about 200 beds conducted by a state supervised employers compensation insurance company. All of the cases treated are of traumatic origin and the great majority are fractures.

To properly handle these cases it has been necessary to standardize methods and materials as much as possible, and Böhler has developed and organized a system of treatment which includes many original features. This book is an exposition of the methods and t chnique employed in the author's clinic. No mention is made of unapproved methods.

The book comprises a small volume of 185 pages with 234 illustrations. The text is clear and the style brief and to the point with the elimination of all unnecessary language. The illustrations are good with many diagrams to explain anatomic principles, photographs showing apparatus and the application of methods of treatment, and roentgenograms illustrating the various fractures. Full use of the illustrations is made in the text. The book is essentially practical, and little difficulty would be experienced by a physician in putting the methods into practice. Principles of treatment are fully expounded and in the main are based upon anatomic principles, among which are some that have not hitherto been stressed. There is a special chapter on apparatus and all of the items and materials required are fully described.

Böhler believes strongly in the immediate reduction of fractures and relies chiefly upon special traction appliances to secure reposition and maintain it while the retentive apparatus is being applied. Skeletal traction is employed not only in fractures of the femur and of the bones of the leg, but also in certain fractures of the bones of the forearm and of the phalanges. Transfixion of the metacarpals and metatarsals by a Steinman nail is resorted to in certain cases. Most of the reductions are performed under local anaesthesia obtained for the most part by infiltration of the seat of fracture with novocaine solution.

The two most debatable matters are the extensive, almost universal use of the non-padded plaster casing and the open treatment of wounds. Plaster is applied directly to the unshaved skin. The advantage claimed for it is better maintenance of reduction, and the dangers are considered negligible when it is skillfully applied. Wounds, whether clean or infected, are treated by open air exposure and complete absence of dressings. Compound fractures are subjected to debridement with the excision of soiled and devitalized tissue and immediate primary closure of the wound. After two or three days the dressings are removed, and the wound exposed to the air. Drier wounds and quicker healing are claimed to result. For infected wounds incision and institution of correct gravity drainage are insisted upon. The wounds are treated by open air exposure. Purulent discharges when present are collected by suitably placed basins. Complete absence of odor and healthier evolution of the wound are claimed.

While many of the methods described are admirable and fully meet the mechanical requirements of the various fractures, other of the methods run counter to the experience and ideas of most authorities on fractures, for example, the fixation of elbow fractures in the position of right angle flexion and early weight bearing in fractures of the neck of the femur. Proof based upon end result studies of groups of cases must be presented before we are justified in accepting any new method as correct and in this book tables of end results are conspicuously lacking. The English edition is unfortunately marred by the translator's inability to eliminate German idioms and construction. The English is faulty in the extreme, but for the most part intelligible.

Decidedly this is a book to recommend to surgeons who are interested or experienced in the treatment of fractures. It will widen their horizon and even though they do not adopt Böhler's methods bodily, they are sure to find items of practical value. It is not a book to be used by students or practitioners as a primary approach to the treatment of fractures.

Surgical Clinics of North America. Volume 9, Number 4, August, 1929. Mayo Clinic Number. W. B. Saunders Co. Philadelphia.

Contributions to medical literature emanating from the Mayo Clinic usually prove of practical value and interest. This volume is no exception.

It opens with a discussion by Judd and Moersch on *pharyngo-esophageal diverticulum.* Symptoms develop slowly commencing with a slight irritation of the throat and increasing to marked regurgitation and obstruction. Operation should usually consist in a preliminary isolation of the sac followed after eight days by its removal.

Sistrunk believes that better exposure for an inguinal hernia operation is obtained by a *combined oblique and transverse skin incision* which is like the usual oblique incision carried mesially just above the pubes.

Epilthelioma of the limbus is one of the most common neoplasms of the eyeball. Benedict has secured excellent results in treating these by fulguration, sometimes combined with radium.

The physiology of cardiac resuscitation is very clearly demonstrated by Markowitz and Mann by animal experimentation. The one important factor in keeping a healthy heart beating is adequate intracoronary pressure.

Adson and McIndoe suggest that the danger from

shock and hemorrhage in intracranial operations may be largely eliminated by the *prolonged intravenous administration of a gumacacia-citrated blood sequence during the operation.*

Rankin reports three cases of *megacolon secondary to carcinoma of the sigmoid* in one of which a hemicolectomy was necessary before the abdomen could be closed. He also gives an interesting discussion of *complications following surgical procedures on the colon* and of methods used to minimize them.

Skin grafts of varied types are described among a group of *cases from the section on orthopedic surgery* by Hugh Jones.

A very thorough study of the *arterial blood supply of the sigmoid and rectum* is presented by Pope and Judd. The severance of hitherto unrecognized arteries supplying the recto-sigmoid accounts for much of the post-operative mortality of surgical procedures in this region.

These with several other clinics and reports of unusual cases make this a volume of much interest to the surgeon.

Diseases of the Larynx, by HAROLD BARWELL, M.B., London, England. Published by Oxford University Press.

This book, an Oxford Medical Publication, appears in the third edition greatly enlarged and revised since its first printing in 1907 and 1910. Since then tremendous advances have been made in the science of laryngology, particularly in respect to the subjects of bronchoscopy and esophagoscopy, and it is along these lines that the present edition has been particularly amplified.

A brief consideration of the anatomy of the upper respiratory tract is followed by a description of the technique of indirect laryngeal examination, endoscopic procedures, and their modifications as described by various well-known endoscopists. The congenital affections, inflammations, and chronic diseases of the larynx follow in order, stress being laid on syphilis, tuberculosis, and granulomatous conditions. Benign and malignant tumors are next described with a brief consideration of the operative surgery employed in their treatment. A chapter is devoted to the neuroses and paralyses, both organic and functional.

Laryngeal stenosis is dealt with in some detail, injuries and foreign bodies with surprising brevity. The relationship of laryngeal disease to other systemic infections precedes a rather brief account of the esophagus and its diseases such as inflammations, strictures, new growths and foreign bodies.

A more detailed chapter dealing with the surgery of the larynx, particularly the operation of laryngectomy, completes the book. A formulary of appropriate laryngeal medications forms the appendix.

The book, intended for the student and general practitioner primarily, is a very satisfactory guide to the study and examination of the larynx. The text, printed on rather heavy paper, is compactly arranged with appropriate headings. Most of the illustrations, drawn by the author and taken largely from his own experience, are extremely clear, if somewhat inartistic, and serve to clarify the text most satisfactorily.

Of a handy size with 275 pages, this book presents a pleasing and valuable account of laryngeal disease.

Mechano Therapy, a Textbook for Student, by MARY REES MULLINER, M.D. Lea and Febiger, Philadelphia, 1929. $2.75.

This book, compiled evidently for students of massage, though it is not so stated on the title page, conveys in a suitable manner the technique of massage and exercises as the author feels this should be done. For the most part this is no doubt correct, but in some respects we cannot agree with the technique. For instance, after stressing the importance of beginning massage of the limbs close to the body and working outward in order to open up the channels, the author goes on to describe the technique in abdominal massage and starts at the caecum, working toward the sigmoid. The same is as true of intestines: that is, that stimulation should begin at the sigmoid and work backward.

The author's idea of the relation of the "mechano-therapist" to the doctor is not as definitely expressed as one would like, and when one reads through, this is emphasized; for on page 164 she states that "the mechano-therapist should have sufficient knowledge to exclude a fracture and make sure it is only a sprain with which she is to deal". In our opinion, such diagnosis should be left to the doctor alone, and many mistakes may thus be avoided.

On page 170, in discussing the treatment of acute synovitis, the author states, "Massage to reduce the swelling is sometimes given, but more often the knee is immobilized in a plaster of Paris cast and kept quiet for weeks". Such treatment can not be said to meet modern orthopaedic standards.

Many flaws in the author's discussion can be detected, but we omit enumeration of these. It is again the same story that physiotherapy, properly supervised, is essential and excellent; but too often its workers go beyond their realm and lead themselves and others into trouble.

The Origin of Malignant Tumors. By THEODOR BOVERI. Translated by MARCELLA BOVERI. Williams & Wilkins Company. 1929. pp. 119. Price $2.50.

This treatise is a thorough exposition of Boveri's theory that the development of malignant tumors is due to the production of an abnormal chromatin complex through abnormal mitoses. He takes into consideration the various factors that may give rise to such abnormal complexes as variations in the character or numbers or combinations of the chromosomes. This exposition of Boveri's theory will be of interest to the investigator and student of malignant disease.

A Study of Masturbation and the Psychosexual Life. By JOHN F. W. MEAGHER, M.D. Second edition. New York: William Wood & Company, 1929. 130 pages. Price, $2.00.

The second edition of this book contains some additional matter that was not published in the first issue in 1924. Much more attention is paid to the psychosexual aspect of the problem and the theories of Freud, Rank and others are discussed. The book is written in a semi-popular style, which detracts considerably from its scientific value. It is still, however, probably the best summary of the subject.

Physical Examination and Diagnostic Anatomy. By CHARLES B. SLADE, M.D. Fourth Edition. Pp. 196. W. B. Saunders Company. 1929. Price $2.00.

Under certain conditions, it is necessary for students to have a text covering the field of physical examination briefly. This book well fills such requirements, without the omission of any of the absolute essentials of physical diagnosis.

In general, the material is accurate. The reviewer has noted now on several occasions that authors of texts on physical diagnosis fail to properly evaluate the murmurs in mitral stenosis. Mention is made of the presystolic murmur but the mid-diastolic murmur which cardiologists have pointed out to be of great importance is usually ignored, as is the case in this book. A discussion of cardiac rhythms is omitted and should find a place in a book of this sort.

The Physiology of Love. By GEORGE M. KATSAINOS, Ph.D., M.D., privately printed. Boston, 1929. Pp. 326.

This volume is devoted to a discussion on the physiology of love or rather its psychophysiology, for it is practically impossible to separate the two aspects of the subject, so closely are they intertwined. It is written with somewhat dogmatic enthusiasm in a flowery, prolix and metaphorical style and there is considerable interjection of the author's personal medical experiences in dealing with the problems under discussion. The subject is treated in a dignified and serious manner, with a scholarly knowledge of ancient Greek literature, mythology and philosophy and the author uses this cultural equipment to illustrate and reinforce many of his theories.

Although the erotic instinct of man is discussed from the physiological, psychological and ethical viewpoints, there seems to be little indication in the book that the author appreciates the great advances made in recent years on the dynamic psychology of the libido and its relation to unconscious thinking.

Following a long introduction on the nature of life, death and love, there is discussed in turn such varied subjects as nocturnal emissions, how man loves, masturbation, the moral aspect of Eros, Sodomy, woman of Athens, etc. There is only a brief mention of Freud and his co-workers in psychoanalysis. Most of the ideas elaborated in the volume are based on theories of the internal secretions of the sex glands and there is a general disagreement on the subject of pregenital organization. The question of sublimitation is discussed from purely the descriptive level, without utilization of the concept of the changes in the libido for the purpose of cultural needs. The modern psychoanalytical theories of dreams receive but scant attention. One point of importance which is emphasized is that erotic attractiveness is psychical and not physical and therefore it is more correct to refer to the psychosexual instinct.

The word "love" is defined in a psychoanalytic sense, that is, with the wide connotation of yearning, solicitude and affectionate devotion, quite apart from its procreative tendencies. On page 120, the authorship of Kraft-Ebing's "Psychopathia Sexualis" is quite erroneously ascribed to Freud. In the discussion of homosexuality there is no mention of the early, underlying fixations which produce this inverted tendency. The condition is explained by the author on the ground that the normal instinct has become perverted by a premature introduction to sexuality, an attitude which puts the cart before the horse. The case of psychosexual impotence described on page 125, is clearly one of the manifest homosexuality.

Artificial Sunlight and Its Therapeutic Uses. By FRANCIS HOWARD HUMPHRIS, M.D., (Burx), F.R.C.P. (Edin.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), L.M. (Rot., Dublin), D.M.R. and E. (Cantab.) Fifth Edition. Price $3.25.

It is a matter of common knowledge that the ultra-violet lamp has become almost a household companion. It has been "sold" not only to the medical profession but also to the public. Lamps are today to be found in the home and in the club, in the institution and in the factory, as well as in the doctor's office.

It is then well that such a book as this should be published. As Dr. Humphris states in the preface to the fifth edition "The employment of artificial sunlight is becoming so widespread, it behooves us to see that its use is more rational and more definite and that its administration be based on clearly defined reasons". And in the preface to the fourth edition he says ". . . this activity has not been altogether an unmixed blessing".

With his goal to see that the employment of artificial sunlight is used more rationally and more reasonably always before him, Dr. Humphris has given us this book in which he has endeavored, with much success, to show, first, what artificial sunlight is; second, to show what it may reasonably be expected to do; and third, to show how one may put these reasonable expectations to practical use.

The book is divided into ten chapters. Chapter I considers the ultra-violet rays from the historical point of view. Chapter II is labelled Facts and Fallacies. Chapter III deals with the various methods of manufacturing the ultra-violet rays with an analysis of the efficiency of the different types of lamps. Chapter IV discusses the therapeutics of the rays. Chapter V tells of the technique of treatment and dosage. Chapters VI and VII give the methods of treatment in a great variety of diseases while Chapter VIII is headed Contraindications. In Chapter IX the use of the x-rays as a complement to actinotherapy is discussed. Chapter X deals with the red and infra-red rays.

One reading the book carefully must be impressed by the thought which Dr. Humphris has put into his work. He first looks over the case and decides what has to be done and then selects the form of lamp which he decides can best accomplish the result he is after. Sometimes he even uses two different lamps in the same case because neither lamp alone will fulfill his requirements. Indeed he recommends that every operator equip himself with two lamps, the mercury vapor and the carbon arc.

Throughout the book Dr. Humphris decries the hit or miss method which uses one form of lamp and one routine technique for every type of case regardless of how the cases may differ. It is noticeable, too, that he seldom gives a local treatment alone but usually combines a general treatment with the local. In so doing he believes that he increases the efficiency of ultra-violet therapy by many per cent. The greatest indication for the use of artificial sun-

light therapy, he contends, is to maintain or to restore health. Upon this foundation he builds his local therapy.

All through the book Dr. Humphris exhibits the greatest precision whether he is discussing a piece of apparatus or a case or a method or a question of dosage. This very fact gives to the book a peculiar value. And nowhere is this value more apparent than in the chapters devoted to apparatus and to technique. Therein everything is stated so clearly and so accurately that these chapters are perhaps the most interesting in the book.

In short, those specializing in actino-therapy and those merely interested in it as an adjunct to medicine will both find this book quite worth while.

The Robert Jones Birthday Volume, A Collection of Surgical Essays. HUMPHREY MILFORD, Oxford University Press. 1928. Price $13.00.

Seldom has there been an occasion better calculated to inspire the highest type of contributions to the literature of Orthopaedic Surgery than that afforded by the plan, conceived by some of his friends, to publish a volume of surgical essays in honor of Sir Robert Jones and to present this volume to him on his seventieth birthday. With the utmost secrecy the plan was put into execution and invitations to contribute were sent out to a group of the élite, comprising friends, co-workers, and former pupils. The response was enthusiastic, the essays were written, the volume was published and presented, and now the book has been made available for members of the medical profession. Any profits which result from its sale are to be handed to Sir Robert to be made use of in furthering the work of rehabilitation of the cripple.

Knowing the kind of men who have been associated with Sir Robert and who constitute the authors of these essays, one approaches this volume with a feeling of confidence and one is not disappointed. One is first impressed by the physical form. The book is large but not forbiddingly thick, although it contains 424 pages of text. Fine glazed paper has been used throughout and the type is large and clear. The articles are well illustrated, and the cuts have been done with care. It is a fine specimen of the art of bookmaking.

One scans the table of contents and finds listed 24 essays with, in addition, a preface by Sir Berkeley Moynihan and an appreciation by Sir John Lyme-Thomas. The contributors include such men as Muirhead Little, V. Putti, Murk Jansen, Hey Groves, Robert Osgood, Clarence Starr, Nathaniel Allison, Harry Platt, Rowley Bristow, Alwyn Smith, Jacques Calvé, Naughton Dunn, and Sir William Wheeler to mention only a few, and the remainder are of corresponding rank and reputation. The essays cover a wide range of topics including Bone Tumors, Bone Growth, Congenital Dislocations of the Hip, Bone Infections, Nerve Injuries, Scoliosis, and the Operative Surgery of Various Joint Conditions. The Preface renders a graceful tribute to Sir Robert, and both in this and in the Appreciation one catches intimate glimpses of his life and work.

It is difficult to select from this wealth of material any particular features for comment. All of the essays are original and the majority are clinical and practical. Under the title of Infantile or Cervical Coxa Vara H. A. T. Fairbank describes what he believes to be a new clinical entity. V. Putti reports a new method for closing the defect produced by the resection of the lower end of the femur for tumors. E. W. Hey Groves describes a new operative technique for certain cases of congenital dislocation of the hip with defective acetabulum. Many of the remaining articles ought to be mentioned in the same way. All are of the highest standard and worthy of the man they are intended to honor. The volume is one to adorn the library of any orthopaedic surgeon, and whoever reads it is likely to imbibe a little of that spirit which animates its pages and which emanates from the Master himself.

Le Diagnostic Dans Les Affections de la Colonne Vertébrale. By P. OUDARD, A. HESNARD, and H. COUREAUD. Masson et Cie., Paris, 1928.

This book is a small paper bound volume of 250 pages with 74 illustrations and an introduction by Professor J. A. Sicard. The authors are Medical Officers attached to the Medical School and Hospital of the French Navy at Toulon. The book is intended to serve as a practical guide to the diagnosis of vertebral lesions. It is divided into two parts, the first dealing with the anatomy of the spine and methods of examination, the second describing the various lesions, their symptomatology and the clinical signs by which they may be recognized.

The chapters on the anatomy and physiology of the spinal cord and methods of neurologic examination are well done, but seem to occupy a disproportionately large amount of space. The subject of Pott's disease is well presented, and the various types of spondylitis are accurately described. Fractures of the transverse processes are mentioned, also traumatic spondylitis, or Kümmel's disease, but the subject of fractures of the vertebral bodies is entirely neglected. Scoliosis is poorly done. Functional backaches and back strains, the most common of all complaints in reference to the spine, are dismissed with a two page discussion.

Altogether this book seems to lack balance, and does not show evidence of the effort to compile all available knowledge or to shed light upon obscure subjects that we feel is necessary in a monograph dealing with the affections of a single part of the body.

Diagnosis and Treatment of Deformities in Infancy and Early Childhood, by M. F. FORRESTER-BROWN, M.S., M.D. (London). Oxford University Press, 1929. $4.15.

The foreword of this volume states that it is especially intended for the school doctor, the general practitioner and those who are interested in Infant Welfare work. As such it is commendable. Adequate information for the student in many instances can be found here, too. It is well illustrated, both as to x-ray reproductions and the cuts of various types of apparatus.

While orthopaedic surgery as a specialty has not reached that degree of perfection where all are agreed as to methods of treatment, we must accept differences of opinion in this regard. However, those set forth in this book are safe and useful procedures, for the most part well established.